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Industrial Hygiene.

INDUSTRIAL BENZOL POISONING IN MASSACHUSETTS.

By Thomas F. Harrington, M.D., Boston,
Medical Deputy Commissioner of Labor.

Benzol, or benzene, is used extensively in the industries of this State, and has given rise to much ill health and has caused several deaths. It is an unstable, very volatile, colorless fluid with a heavy aromatic odor. It is a derivative of coal tar distillation, and is frequently confounded in literature with *benzine*, a petroleum derivative with which it has many properties and uses in common. Benzol is decidedly more poisonous than benzine.

It contains many poisonous substances, such as hydrogen sulphide, toluene, and bisulphide of carbon (50 per cent., often). Much of the toxic effects noted is due to these substances. Poisoning by benzol depends upon individual susceptibility and immunity (natural or acquired), as well as upon the quantity and proportion of impurities in the fumes inhaled.

The principal uses of benzol (benzene) are: Manufacture of colors and dyes; carborizing motor gas and illuminating gas; refining and dissolving fat and grease; lacquer (acid proof) colors and varnish work; rubber industry; as a cement in auto tire-building; in anti-rust, anticorrosive and rapid drying paints. It is also used in the manufacture of pharmaceutical preparations, *e. g.*, aspirin, antipyrine, etc., as well as in the preparation of perfumery scents. Lately, benzol has been extensively used as a substitute for benzine and oil of turpentine, because of its great power in dissolving resin.

Benzol, like its homologues and other hydrocarbons of coal tar, has a specific affinity for the central nervous system and a general action on the protoplasm of the organic cell. The remarkable property possessed by benzol of reducing the number of leucocytes in the blood has given to it a place in medicine in the treatment of myelogenous leukemia. Female workers, particularly at the age of puberty and at the menstrual period, are especially susceptible to benzol poisoning. Symptoms of benzol poisoning vary much with the mode of poisoning; *i. e.*, whether in the form of vapor through the respiratory organs, or by absorption through the skin, or through the digestive tract.

The following cases reported to the State Board of Labor and Industries are typical of the symptoms and result of benzol toxemia.

ACUTE BENZOL POISONING.

Two steamfitters were employed in repairing pipes inside a benzol still that had been drawn off three days previously. These men worked together inside the still. This retort was 5 ft.x8 ft. and was entered by a manhole opening 11 in.x15 in. A stream of compressed air under sixty pounds' pressure was fed into the still by a 2 in. pipe while the men were engaged at this work.

One workman, 35 years of age, entered the still about 11 a. m. and worked until 12 noon. He and another workman, 23 years of age, entered the still at 12:30 p. m. At 1:15 p .m. the older man became greatly excited, laughing, singing, gesticulating and acting "as if he had gone crazy." He soon became unconscious and was lifted through the manhole by his fellow worker. It required twenty minutes to get his body through the opening of the retort. It was then discovered that the younger man was unconscious on the floor of the still. He was removed and all efforts to resuscitate him failed. No autopsy was held.

The older man was resuscitated by artificial respiration, oxygen inhalation, lung motor and stimulants. Several days later he was able to report for work.

ACUTE NITRO-BENZOL POISONING.

A man, sixty-five years of age, employed as a teamster for a soap factory, on July 7, 1916, while delivering a five-gallon flask of oil of mirbane (nitro-benzol) accidentally loosened the cork of the flask, spilling the chemical onto his clothes. A fellow workman noticed a pale, sick appearance and before he could reach the teamster he had grown dizzy, nauseated, cyanotic about the lips, mentally confused and was soon unconscious. Artificial respiration failed to resuscitate him and he was taken to the hospital. He soon developed Cheyne-Stokes respiration, slow, weak pulse, blood pressure 90 systolic, 50 diastolic. Blood showed methaemoglobin; later convulsion and coma developed, followed by death three and one-half hours after the accident. Autopsy findings: Poisoning by nitro-benzol.

CHRONIC BENZOL POISONING.

In view of the little information available on this subject in textbooks, the five chronic cases of benzol poisoning (three fatal) reported in Massachusetts are given in detail. All of these cases occurred in the auto tire-building department of a rubber establishment in which benzol cement was used. The process was essentially as follows: The benzol was poured from a can which was rigged with a ball-cock arrangement and a trigger handle so that it was necessary to pull the trigger in order to get a flow of benzol from the can. The benzol was poured onto a cloth and wiped around the tire, preparatory to vulcanizing. This process was repeated about every half hour, or approximately eighteen times in an eight-hour day.

1. (Fatal) A man, 33 years of age, had been employed in the rubber industry since 1907. On April 20, 1915, he was transferred to the tire-building department. He soon complained of severe headaches, often lasting two or three days at a time. In March, 1916, he noticed that he was spitting blood, especially after brushing his teeth. This condition of spongy, bleeding gums was noticed almost daily, and later in March he noticed bluish-green spots on his left thigh, followed in a few days by similar spots on his left arm. Soon similar spots appeared in rapid succession on various parts of the body. On May 3rd he gave up work on account of extreme weakness and dyspnoea on slight exertion. On this date he had a severe nose-bleed, followed by a similar attack on May 7th, when he was admitted to the hospital.*

Physical examination showed spongy, bleeding gums, pale mucous membrane of throat and conjunctiva, ulceration in posterior nares. Spleen not palpable. Knee jerks present and equal. No Babinski, no ankle clonus. Eyes react to light and to distance, no nystagmus. Breath, foul odor. Free bleeding from right nostril. Speculum examination showed bleeding point on septum about ¾ inch back and near floor of nares. Patient conscious, slight tremor of head, no glandular enlargements, lungs normal, heart sounds weak, regular, no murmur, spleen not felt, liver 2 cm. below costal margin, no masses in abdomen, no spasm, no tenderness. Ecchymotic spots on skin, most marked on outer side of left arm near shoulder and on outer side of each leg. Family history and personal history good. No purpura nor haemophilia in family. Pulse 124, weak. Vertigo and visual disturbance.

Haemoglobin	60%
Leukocyte count	5,000
Red count	2,288,000

Transfusion of ten ounces of blood, followed by uncontrollable epistaxis. Nose-bleeds daily, severe and uncontrollable. Gums spongy and bleed on least irritation. Headache, vertigo, dizziness, restlessness, delirium, talkative, loss of power of arms and legs, coma, convulsions and death on May 18th. Autopsy diagnosis: Benzol poisoning.

Blood Record.

	May 7	May 11	May 12	May 14	May 16
Haemoglobin	60%	45%	40%	40%	35%
Leukocyte count	5,000		1,810	1,100	850
Red count	2,288,000		2,184,000	2,720,000	1,616,000
Polymorphonuclears	....	29	....	....	14
Large Mononuclears	....	14	....	....	20
Small Mononuclears	....	53	....	....	62
Eosinophiles	....	2	....	....	2
Myelocytes	....	2	....	....	2
Platelets	....	Dimin.	....	....	Much dimin.
Achromia	....	Slight	....	....	Slight
Poikilocytosis	....	Slight	....	....	Slight
Megaloblasts	....	Few	....	....	Few

2. (Fatal) A man, 40 years of age, had worked in a rubber factory since 1905. On May 21, 1915, was transferred to the tire-building department. In winter of 1915, noticed much loss of muscular power. Easily fatigued, dyspnoea on least exertion. He was not able to work continuously, was losing in weight, had repeated attacks of headache. In March, 1916, began to have bloody stools. April 1st, noticed tendency to have nose-bleeds and a constant cold in the head. About May 1st, had the first severe nose-bleed that he had difficulty in controlling. Gave up work on account of loss of muscular power, dizziness and shortness of breath.

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* The clinical records of these three cases of chronic benzol poisoning were furnished by St. Elizabeth's Hospital, Brighton.

Entered hospital May 3rd on account of severe nose-bleed.

Physical examination: Well developed and nourished, skin sallow, anemic mucous membrane, ulceration and bleeding spot in nose. Gums spongy, marked ecchymotic areas over lower and upper extremities, some areas being so large as to suggest trauma. No rigidity of neck, no glandular enlargement; lungs, heart and abdomen negative. No nystagmus nor strabismus, disc lemon color, teeth in poor condition, gums spongy, with blood oozing at junction of gums and teeth. Knee jerk present and equal on both sides. No ankle clonus, Babinski nor Oppenheim. No disturbance of sensation. Pulse 120; palpitation, vertigo, haemoglobin 65%; leukocyte count 10,000; red count 3,400,000; blood pressure 120 mg.

Patient failed steadily. Nose-bleeds frequent and more severe. Twitching of limbs and head. Paralysis, delirium, Cheyne-Stokes breathing, involuntary movements of bowels, coma. Death May 20th. Autopsy diagnosis: Poisoning by benzol.

Blood Record.

	May 3	May 10	May 12	May 13	May 16
Haemoglobin	65%	45%	45%	45%	40%
Leukocyte count	10,000	4,800	2,300	300	750
Red count	3,400,000	1,872,000	1,632,000	1,552,000	1,742,000
Polymorphonuclears	....	38	....	....	27
Large mononuclears	....	10	....	....	13
Small mononuclears	....	48	....	....	54
Eosinophiles	....	3	....	....	5
Mast cells	....	1	....	....	1

3. (Fatal) A man, 30 years of age, had worked in a rubber factory about two years (since 1914) in tire-building department. No history of nose-bleed, purpura, no hemophilia, either individual or family. Late in 1915, noticed some "red spots" on face and neck. These persisted for about three weeks. During the spring, 1916, noticed that he was much weaker and not able to do his work so well as formerly. Had headaches and dizzy spells. On May 6, 1916, consulted a physician who reported symptoms as follows: Pallor, general weakness, loss of weight, dyspnea, pulse 100-110, palpitation, weakness of gait, headache, dizziness, tinnitus, low white and red count, dry cough. Man returned to work but had to quit again on May 27th. Returned to work again on June 12th.

On July 6th had nose-bleed from left nostril, lasting six hours. The symptoms increased in severity: Pallor, muscular weakness, loss of weight, dyspnea, weakness of gait, tinnitus and nose-bleed. Brought to hospital on July 20th on account of severe uncontrollable bleeding from left nostril.

Physical examination: Pale, anemic, mucous membrane pale. Patient conscious, pupils equal, mouth and teeth in good condition. Gums bleeding, lungs normal, heart rapid, pulse regular, systolic murmur at apex, spleen not palpable, liver 1 cm. below costal margin, no spasm, no tumor, no tenderness. Brownish-yellow stains and evidence of ecchymotic areas on anterior surface of both thighs; knee jerks lively, equal on both sides. Patient grew worse daily and on July 30th developed lobar pneumonia with edema of lungs. Died August 2nd. Autopsy diagnosis: Acute lobar pneumonia, edema of lungs, anemia, exhaustion, consequent on poisoning by benzol.

Blood Record.

	July 20	July 23	July 26	July 28	July 30
Haemoglobin	40%	40%	30%	35%	30%
Leukocyte count	2,000	2,100	2,200	1,840	1,600
Red count	2,136,000	2,048,000	1,364,000	960,000	944,000
Polymorphonuclears	29	....	30	....	....
Large mononuclears	7	....	13	....	....
Small mononuclears	62	....	55	....	....
Eosinophiles	2	....	1	....	....
Masts	Few	....	1	....	....
Platelets	Dimin.	....	....	....	....
Achromia	Mod.	....	....	....	....
Poikilocytosis	Mod.	....	....	....	....
Coagulation time	....	18	....	....	....

4. (Non-Fatal) Man, 20 years old, employed in a rubber factory since February, 1915. His duties consisted in receiving tires after they had been cured and apply to them a benzol cement. In March, 1916, he manifested symptoms of benzol poisoning, and in May reported to the hospital for asymmetry of face which he ascribed to the extraction of a tooth. Blood examination showed a haemoglobin of 75%, leukocyte count of 6000, red count 4,480,000. He had headache, nausea, general weakness.

5. (Non-Fatal) Man, 29 years old, employed for more than two years in automobile tire-building in which he wiped benzol to the fabric. For past three months has had a papular eruption size of pin head on extensor and flexor surfaces of arms, feet, ears and neck. Later this eruption developed into blebs. Very itchy and accompanied by fever. Stated that 16 or 18 men among the 120 employed in that department had similar eruption. Disappear on substituting naphtha for benzol.

A chemical examination of the benzol used by these men showed it to be free from impurities and of the pure benzol grade. In one of the cases the presence of arseniuretted hydrogen in large quantities in the urine raised a doubt as to possible arsenic poisoning. This was traced, however, to treatment by Fowler's Solution that the man was taking for anemia. The use of the benzol as a cement at the factory, in the tire-building process, was discontinued and naphtha substituted. No further cases of benzol poisoning have been reported to the State Board of Labor and Industries since this change.

Original Articles

ESSENTIAL SHRINKING OF THE CONJUNCTIVA OCCURRING IN ACUTE AND CHRONIC PEMPHIGUS, WITH A REPORT OF TWO CASES.

By Frank A. Conlon, M.D., Lawrence, Mass.

Essential shrinking of the conjunctiva is simply a descriptive name of the end-result of pemphigus of the conjunctiva, although some men,[1] failing at the time of their examination to find specific evidence of a general pemphigus, have considered it a separate and distinct disease.

After a careful review of the literature, I find that all of these cases, so considered, come under Thost's[2] classification of chronic pemphigus of the mucous membrane, of which he gives the following characteristics:

1. Affection exclusively of the mucous membrane.
2. Unusual participation of the ocular mucous membrane, which tends to form synechiae.
3. Tendency to adhesion of all mucous surfaces.
4. Chronic evolution without fever.
5. Treatment of no avail.
6. Cachexia and dystrophy, cutaneous and muscular.

The lesions in the mouth or nose may easily be overlooked, as my patient told me her eyes troubled her so much that she had entirely forgotten about the condition in her mouth.

Pemphigus of the conjunctiva was first described by White Cooper[3] in 1858. It was described as syndesmitis degeneration by Stellwag[4] in 1870, and as essential shrinking of the conjunctiva by Kries, in 1878, of von Graefe's clinic. Von Graefe, in 1879, propounded the identity of pemphigus and essential shrinking of the conjunctiva.

It is a very rare disease. Adam[5] saw one case in eleven thousand ophthalmic cases; Franke,[6] five cases in forty-five thousand; Pergens,[7] two in twenty-two thousand, while the late Herman Knapp[8] saw but one case in his long experience. It occurs with equal frequency in both sexes and at all ages; Alt[9] reporting one in a girl of four and Banysiekiews[10] in a woman of seventy-six.

Etiology. In the majority of cases there is no predisposing condition or cause, yet in a few a septic[22] wound or vaccination[23] has been given as its origin.

A specific organism has been found in the bullae by the following writers: Cirincione,[11] Demme,[12] Dahnhardt,[13] and Blutrau.[14] They describe it as a diplococcus, rather larger than the gonococcus, which forms round, white colonies on agar, grows rapidly on bouillon at 37; well on agar and serum. The cocci stain with aniline dyes and by Gram's.

The cocci are not present in the sac after cicatrization is complete, and do not cause shrinking when placed in the conjunctival sac of animals, but do cause a rather severe conjunctivitis. Demme found the diplococcus in the blood. Xerosis bacilli in large numbers have been frequently demonstrated, but this, undoubtedly, has been due to the favorable soil found in the degenerate corneal epithelium. By some the condition is regarded as due to the action of toxins upon the nerve centers, resembling herpes in this respect.

Case 1. Mrs. G., fifty years old. Pemphigus lesions first observed in the mouth along the first of August, 1915. Patient seen December 20, 1915, at which time she presented large bullae all over her body, with involvement of both eyes. The right eye presented an elevated, sharply defined spot five millimeters from the corneal sclerae on the nasal side about three millimeters in diameter. There was a loss of epithelium in the center, evidently a ruptured vesicle. Another similar spot was seen on the ball on the temporal side. The left eye showed two spots on the bulbar conjunctiva in corresponding positions and of identical appearance. Patient said her first eye trouble occurred one month before and lasted a week, and that the present lesions appeared that morning. Palpable conjunctiva was slightly injected and there was a beginning obliteration of the lower culs-de-sac. This seems a remarkably short time for a noticeable shrinking to develop, yet Stieren[15] saw an almost complete obliteration of the conjunctival sac develop in six weeks.

Case 2. Mrs. K., 50 years old, American born; while never a robust woman, she always enjoyed good health. I first saw this patient May 15, 1915, when she complained of an irritation due to entropion of her left lower lid. My records showed at that time twenty-twentieths vision in each eye, both corneae normal, slight redness of the bulbar conjunctiva of the left eye. The lower conjunctival sacs of both eyes were from three to four millimeters in depth, with numerous vertical folds of glistening white conjunctiva. At this time there was no appreciable involvement in the upper fornix of either eye. In June, 1916, she developed an erosion covering the lower half of the left cornea (ruptured bulla) with an iritis. Within a month, there was a complete obliteration of the lower cul-de-sac. The condition of her right eye remained unchanged from the time of the first examination, in May, 1915, until December, 1916, when there was a rapid obliteration of the lower cul-de-sac, which became complete in February, 1917. At the present time the patient can open her eyes but two or three millimeters. Both lower lids are attached, their full length, to the eyeball and lower part of cornea. The cornea of the left eye is obscured by a dirty-white exudate or membrane, which can be removed with difficulty, showing a diffuse infiltrate of the cornea proper covered with dull, dry xerotic epithelium. In the inner canthus the edges of the lids have grown together for about six millimeters; this condition exists in the outer canthus also, but not to such a degree. This ankyloblepharon has developed very rapidly during the past month, and if it continues its present progress, the eye will be completely closed in a very short time. The right eye is very similar in appearance to the left eye, except that the cornea is still normal. The same dry white exudate is just appearing in this eye, which greatly interferes with what little vision the patient now retains.

I know of no better description of the appearance of these eyes than that given by White Cooper, in 1858, when he said, "one would have pronounced that some powerful escharotic, such as lime, had been applied to them." This patient at first denied having any trouble with her mouth or nose, but on close questioning she remembered being treated, by a dentist, for blisters in her mouth in the summer of 1914. The dentist informs me that he treated her for a peculiar condition of her gums, which was characterized by the peeling off of rather large areas of mucous membrane, which left a bleeding surface underneath. Local treatment had no effect upon the condition. The patient says that she feels a blister in her mouth, which breaks in three or four minutes, leaving a sore spot which causes considerable pain, from three to five days, while eating. The short period before rupturing, as compared to those on the skin, is due to the much more delicate epithelium, and explains why we practically never see bullae in cases of chronic pemphigus of the mucous membrane. This patient is now able to open her mouth but about half way, owing to the cicatrization of her buccal mucous membrane. Trautman[24] saw a patient whose mouth was completely closed for eighteen years, due to the extensive cicatrization characterizing this disease. The left side of the roof of her mouth is covered with dense scar tissue. Erosions and scar tissue cover both sides of the septum. The naso-pharynx and larynx show no signs of involvement. There have never been any lesions on the skin.

Pathology. From the appearance of symblepharon one would naturally suppose the process was the growing together of two denuded surfaces, but a careful microscopic examination shows that this is not the case. A very complete pathological report was published by Adam[5] and another one by von Marenholtz.[16] Adam says, "The essential process of pemphigus of the eye is not the formation of bullae, with consequent healing, but is an inflammation of the sub-epithelial and adenoid layer of the conjunctiva going over into cicatrization. The shrinking of the conjunctival sac is not due to a sticking and growing together of the conjunctiva, but to a cicatrization of each spot of inflammation. The result is a formation of vertical folds which appear like adhesions. He found in his corneal section that the process consisted of a denudation of epithelium, followed by an irregular regeneration of exuberant granulation." Von Marenholtz found the cornea covered by epithelium from the lids.

Treatment. The treatment is very unsatisfactory. Thiersch grafts have been done by some,[8, 17] with good surgical results, but the degenerative changes in the cornea have nullified their efforts.

Ogue and Imai report disappointing results with treatment by x-ray and radium. Bordley[18] used a vaccine made by the anaerobic method of Noguchi and Flexner, and saw a temporary improvement, while Bishop Harmon[19] used vaccine with absolutely no results. Bane reports a retardation of the disease by treatment of the x-ray, but I think his case may have been one which was treated in the quiescent stage. In my case there is no change in the right eye in eighteen months, and in Burk's[21] there was none in twenty years, so one must be careful and not ascribe to the treatment that which may be the untreated course of the disease. I have used thiosinamin and the improved product, fibrolysin, without noting any improvement whatsoever. Fibrolysin was used by von Marenholtz for four months with slight improvement. Arsenic is given, as a rule, with vain hope that it may do good. Pemphigus of the conjunctiva may result in blindness in four to six weeks, or a patient may suffer from the disease twenty or thirty years without corneal involvement and its consequent loss of vision. Up to date we are helpless and unable in the slightest degree to influence the progress of the disease.

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INTESTINAL ADHESIONS AND PERITONEAL BANDS IN EPILEPTICS.*

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So much emphasis has been placed upon the abnormalities of the gastrointestinal tract, and the relation of the superimposed condition of chronic intestinal stasis to the convulsive seizures, that at times it has almost appeared necessary to assume that every constipated individual was a potential epileptic. But the fact remains that most constipated individuals are not. There is, without doubt, one type of epilepsy where a definite relationship between intestinal conditions and the seizures does exist, but it includes only a small percentage of those suffering from this group of diseases. The purpose of this paper is, first, a consideration of the causes of chronic intestinal stasis; second, the etiologic factors present in the causation of intestinal adhesions and abnormal peritoneal bands; and, third, inasmuch as these bands and adhesions give some evidence of the presence of colonic stasis, a comparison of the incidence of this pathologic condition as found in the necropsy protocols of an institution for epileptics and in those of a general hospital.

The abnormalities of the intestinal tract may manifest themselves clinically by varying degrees of chronic intestinal stasis. It is possible that derangements of the metabolism of the endocrine glands may play a part in the causation of this condition in those epileptics in whom intestinal stasis is a prominent symptom.[1] But the more usual causes of chronic intestinal stasis are frequently found present in epileptics. The sedentary conditions under which, of necessity, many of those suffering from this group of diseases must live, combined with general mental apathy, due to the disease itself or to bromism, may produce the condition in some. Restricted diets, lessened water intake, gluttony, lack of habit formation, flabby abdominal musculature, and overpowering inhibitory influences surely play their part.

Increasing resistance to the passage of the fecal current may be due to enteroptoses, angulations, fibrous bands and adhesions, strictures of the lumen of the gut, movable cecum, and the like. But while developmental and congenital anomalies are at the bottom of many cases of constipation,[2] yet roentgen ray examinations have shown that such mechanical obstacles do not, necessarily, entail a condition of stasis. Indeed, passage through the large intestine may occur quite normally in spite of them.[3] With the possible exception of colonic atony or colonic tetany due to disturbances of innervation of the intestines, the chronic intestinal stasis of epileptics depends upon the same causative factors as found in every constipated individual.

Intestinal bands and adhesions have been selected for this study, for the reason that they are not affected by post-mortem changes, and, in consequence, assuming that the error of omission is a constant, the conclusions drawn from their incidence are less open to criticism. There are three important factors in the causation of intestinal bands and adhesions, namely, (1) defects in embryonic development, (2) acute inflammations of the peritoneal surfaces, and (3) mechanical causes.

Congenital anomalies are by no means frequent. Under this heading may be mentioned the peritoneal bands and web-like processes which, arising in the vicinity of the gall-bladder, extend across to the pylorus, duodenum, hepatic flexure, and transverse colon. These are probably remnants of the anterior mesentery. I have found such processes in eight necropsies upon epileptics. They may not give rise to symptoms, but Homans, in a clinical study of eleven cases, mentions constipation as being present in two. One of these, at operation, showed a firm band of peritoneum stretching across the hepatic flexure.[4]

The acute inflammatory factors giving rise to adhesions included such conditions as tuberculosis, peritonitis, gall-bladder disease, appendicitis and its complications, inflammations of the female adnexa, and other acute abdominal states. The *modus operandi* of these lesions is well known. In this connection it may be well to suggest that adhesions about the appendix may be due to mechanical causes as well as to acute infections.

The mechanical factors are at work chiefly in the region of the colon, and resulting from stasis serve to accentuate any intestinal abnormality that may be present.[5] It has been suggested that the sequence of events in the formation of pericolonic membranes is first a condition of colonic stasis from any of the causes, or combinations of them, mentioned above. Then colonic dilatation with increasing stasis occurs, until finally bacterial invasion and toxin osmosis into the pericolonic tissues causes the formation of anchoring bands or diffuse membranes. It is of interest that Turck has shown that the intestinal wall is permeable to the intestinal flora, and that histological changes occur in the cells, through which the bacteria may have migrated.[6]

In a recent investigation I came to the conclusion that peritoneal bands and intestinal adhesions played but a small part in the causation of colonic stasis, but stated that their presence was an indication that, in at least some degree, this condition had been present.[7] From the standpoint of pathological material they may well serve as a method of comparing intestinal abnormalities and symptoms among epileptics and normal individuals. It is hardly to be denied that functional tests as shown by roentgenographic work is a far more desirable index to base conclusions upon, but at present such comparisons are hardly feasible.

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* Read before the National Association for the Study of Epilepsy, May 29, 1917.

I have reviewed the protocols of 280 necropsies on epileptics recorded at the Monson State Hospital from 1900 to the present time. Acute abdominal conditions and adhesions complicated by carcinoma have been omitted from the tabulation. In this series, intestinal adhesions and peritoneal bands were mentioned in 50 necropsies (17.85%). Peritoneal bands were found originating in the region of the gall-bladder and extending across to the hepatic flexure and transverse colon in eight cases. In five only the duodenum and pylorus were involved by such bands. In none of these was there any evidence of gall-bladder disease, gastric or duodenal ulcer. Extensive adhesions due to cholecystitis were found in two cases. Adhesions between the coils of the small intestine were present in eight, and in only one of these was there any apparent connection with inflammation in the right inguinal region.

Turning to the region of the large intestine, adhesions of varying degrees about the appendix were found in fourteen protocols. In three more both cecum and appendix were involved. In two cases there were firm bands about the cecum alone, one being due to an appendectomy. The ascending colon was found to be firmly bound down once, while the descending colon was similarly affected twice. Four protocols described bands causing displacement of the splenic flexure. The last necropsy of this series was complicated by umbilical hernia. The adhesions found present were due to this, but the epilepsy had been definitely established before the appearance of the hernia. It will be noted that in thirty-eight of these protocols, the adhesions and bands mentioned were about the large intestine, especially in the region of the cecum and ascending portion. It is in the large gut that stasis would naturally occur.

Table I.—Site of Adhesions in 280 Necropsies on Epileptics.

Gall-bladder to duodenum and pylorus	5
Due to cholecystitis	2
Small intestines	7
Small intestines plus cecal adhesions	1
Appendix	14
Appendix and cecum	3
Cecum	2
Ascending colon	1
Gall-bladder to hepatic flexure and transverse colon	8
Splenic flexure	4
Descending colon	2
Due to hernia	1
Total	50

But does the above incidence of adhesions among epileptics differ at all from that of non-epileptics? For this purpose, through the courtesy of Dr. Frank B. Mallory, of the Boston City Hospital, I investigated some 775 necropsy protocols contained in the records of the pathological laboratory of that institution for the years 1900-1-2-3-10. Omitting acute abdominal disease, as well as carcinoma, I found mention made of bands and adhesions in 142 protocols (18.3%).

Turning first to the region of the gall-bladder, this viscus was bound down to the duodenum and pylorus in four cases. In twenty-three more, peritoneal bands and adhesions stretched from the inferior surface of the liver across to the transverse colon and hepatic flexure; one of these had, furthermore, firm adhesions about the splenic flexure, while three were complicated by gall-bladder disease. In seventeen protocols, adhesions between the coils of the small intestines were mentioned, and in only three was there definite evidence of inflammation about the appendix, thus indicating an earlier acute peritonitis. Varying degrees of tying down of the appendix were found in forty-four cases, while in fifteen more the adhesions involved the cecum as well. One of the latter showed an abnormal band of peritoneum stretching across the splenic flexure. The cecum alone was found involved in nine cases. The ascending colon was firmly tied down in two. Bands about the hepatic flexure were described in five, while the splenic flexure was similarly involved in three. The descending colon was buried in pericolonic membranes in three cases, while there were bands and adhesions of varying degree about the sigmoid in seven. Of the remaining protocols, adhesions in four were due to hernia, and in six to operative procedures within a year preceding time of death. It will be noted here also that the site of predilection for adhesions and bands appears to be in the vicinity of the large intestine. From a total of 142 protocols, over two-thirds showed bands in this region.

Table II.—Site of Adhesions in 775 Necropsies at a General Hospital.

Gall-bladder to duodenum and pylorus	4
Due to cholecystitis	3
Small intestines	14
Small intestines plus appendiceal bands	3
Appendix	44
Appendix and cecum	15
Cecum	9
Ascending colon	2
Gall-bladder to hepatic flexure and transverse colon	20
Hepatic flexure	5
Splenic flexure	3
Descending colon	3
Sigmoid	7
Due to hernia	4
Operations within a year	6
Total	142

To recapitulate briefly, it has been shown that in a review of 775 necropsy protocols of patients in a general hospital the incidence of intestinal adhesions and peritoneal bands was found to be relatively the same as in a series of 280 necropsies upon epileptics. Considering each portion of the intestinal tract separately, it will be noted that this general statement holds true throughout. The favorite site of these adhesions is about the large intestine, thereby favoring the presence of colonic stasis.

CONCLUSIONS.

1. In view of our present knowledge, the constipation of epileptics cannot be said to be due to factors differing far from those usually considered in the colonic stasis of other patients.
2. Intestinal adhesions and peritoneal bands are due to congenital defects, acute inflammatory processes, or mechanical causes.
3. Such processes are no more frequent in epileptics than in non-epileptics.
4. It seems probable that intestinal anomalies are not present in any greater proportion in epileptics than in other persons, and in the last analysis, we are still combating, from a therapeutic viewpoint, a general condition, and no one particular lesion or pathologic phase of metabolism.

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A COMPARATIVE STUDY OF FEEBLE-MINDEDNESS AND PSYCHOPATHIC PERSONALITY AMONG OFFENDERS IN COURT.

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IN a former paper attention was called to three distinct types of mentality found among border-line mental cases in court: the defective mentality, the psychopathic mentality, and the delinquent mentality as such.

To be sure, there is often an over-lapping in the same individual, but for purposes of practical classification we may regard these three types of mentality as definite entities. Certainly they seem to present very marked individual differences, and create—because of essential constitutional dissimilarities—social problems that require entirely different angles of approach in dealing with them.

The present paper undertakes a comparative study of two of these types—the *feeble-minded* and the *psychopaths.*

For the purposes of this study two hundred cases were selected, one hundred from each group. The object of this study was to find out whether the apparent differences existing between these two types of individuals were sufficiently marked to make a separate classification practical.

The cases were taken from the files alphabetically and represented the first one hundred of each group whose clinical histories contained sufficient data to warrant inclusion for study.

As a matter of course, the earliest noticeable deviations were in childhood. Their ability to profit by school instruction sharply divided our two hundred cases into two well-defined groups. On the one hand, we find individuals perfectly capable of profiting by school instruction, advancing from year to year, and, in the majority of instances, graduating from grammar school, many doing well in high school, some graduating and going on to college.

On the other hand, we find a group of individuals, none of whom were able to graduate from grammar school, all of whom evinced an apparent incapacity for profiting by ordinary school instruction, could not measure up to the standards of normal mental development, as required by the public school curriculum, and, in general, were regarded as mental failures. The following table indicates the grade reached upon leaving school.

GRADE REACHED AT SCHOOL.

		FEEBLE-MINDED	PSYCHO-PATHS
Grammar Grades	Primary	4%	0
	1st Grade	11%	0
	2nd "	4%	0
	3rd "	12%	1%
	4th "	14%	0
	5th "	23%	2%
	6th "	11%	2%
	7th "	9%	4%
	8th "	7%	7%
	9th "	0	9%
		0	38%*
High School	1st year	0	4%
	2nd "	0	8%
	3rd "	0	1%
			6%*
College	Freshman year	0	1%
	Sophomore year	0	1%
	Junior year	0	1%
Data not obtained		3%	13%
No schooling		2%	2%

* Graduated. No other schooling.

The feeble-minded collect at the lower end of the scale, while the psychopaths collect at the upper end. A majority of the feeble-minded—68%—never got further than the fifth grade in school, while 82% of the psychopaths got above the fifth grade. 60% of the psychopaths graduated from grammar school, 22% of the psychopaths went to high school, 9% graduated from high, and 3% went to college. Not a single feeble-minded individual was ever able to finish grammar school.

This difference in behavior, at the very beginning of their training for life's battles, constitutes the first link in the chain of evidence for differential diagnosis between these two types. One group very early in the race becomes disqualified and drops out. The other group goes on to a more successful accomplishment of required training.

In due course of time our individuals reach that stage of their careers where the sterner problems of self-support are to be reckoned with. Just what individual differences their behavior here exhibited the following table will indicate.

TABLE OF INDUSTRIAL EFFICIENCY.

	Regularly Employed	Irregularly Employed	Odd Jobs	Work at Home (Women)	Do Not Work at All
Feeble-minded	4%	21%	28%	13%	34%
Psychopaths	28%	41%	4%	17%	10%

Seven times as many psychopaths are steadily employed as feeble-minded. While the feeble-minded in a majority of instances (62%) are either unemployable or simply do odd jobs, the psychopaths in 69% of cases were either steadily or irregularly employed and self-supporting.

The feeble-minded as a class are in the majority of these cases industrially inefficient and not capable of "holding down" positions for any length of time; while the psychopaths as a class are, in the majority of these cases, fairly efficient, industrially, capable of holding positions for much longer periods, and, when they lose such, do so more because of their temperamental peculiarities, their emotional instability, etc., than any real lack of industrial efficiency.

From these two types are drawn a large percentage of repeated offenders. The following table indicates the comparative frequency with which they appear in court.

TABLE OF ARRESTS.

	Total No. of Arrests	Average Each
Feeble-minded	1825	18.25
Psychopaths	369	3.69

It appears from the above that the feeble-minded are arrested almost five times as frequently as the psychopaths. Now this surely does not mean that the feeble-minded are five times as wicked or as delinquent as the psychopaths. It very probably refers to the fact that, being more stupid, they are more easily caught. Likewise, being economically more unstable, they drift aimlessly, falling into the hands of the court for various minor offenses which the psychopaths, because of their greater intelligence and economic efficiency, are able to avoid. Whatever be the explanation, I present the objective facts for what they are worth.

I shall review two main efforts at treatment tried by the court: *probation* and *penal treatment*. The following table shows the different reactions of these two types to probation:

TABLE OF PROBATION.

	F. M.	Psycho.	Feeble-minded	Psychopaths
No of times placed on probation			432	161
No. times surrendered	220	50		
No. times inside probation	118	18		
No. times defaulted		14		
No. of unsuccessful probation periods			338	82
No. successful probation periods			94	79
Percentage successful probations			21%	49%

79% of the probation periods of the feeble-minded were unsuccessful, while 51% of the probation periods of the psychopaths were unsuccessful. 21% of the probation periods of the feeble-minded were successful, while more than twice that number (49%) of the probation periods of the psychopaths were successful. The chances are better than two to one in favor of the psychopaths, and this without any special efforts directed towards training them to counteract those difficulties of personality most responsible for their failure. It is quite likely that more can be done for the psychopaths through probation than through any other agency, provided their treatment be guided by a knowledge of their temperamental peculiarities, their personality mal-adjustments, so that their environment can be suitably influenced or chosen for them and they themselves trained to inhibit their impulses.

The feeble-minded are less promising. They suffer from a fundamental defect in their intelligence that renders them incapable of profiting properly by experience and prevents them from measuring up to the accustomed standards of conduct. Only a small percentage—in these cases not more than 25%—could be considered satisfactory probation cases. The larger proportion of the feeble-minded are needing more or less permanent supervision.

The court tried also penal treatment, as the following table will show.

TABLE OF PENAL TREATMENT.

	No. of Sentences	Average Each	Length of Time Sentenced	No. of Indeterminate Sentences
Feeble-minded	735	7.35	106 years	250
Psychopaths	71	.71	12 years	14

40% of the arrests in case of the feeble-minded resulted in a sentence, while only 19% of the arrests in case of the psychopaths resulted in a sentence. Likewise, the length of time sentenced is proportionately much longer for the feeble-minded, though the type of offenses committed remains much the same. A recognition on the part of the judge of a difference in the character of treatment needed for these two types is apparent, though the real explanation may be found in the length of their records and recommendations of the probation officer.

Finally we come to the mentality of these two types. It stands as the most important, the most fundamental factor underlying all the foregoing facts.

Table of Mental Level.

	7-8 Yrs.	8-9 Yrs.	9-10 Yrs.	10-11 Yrs.	11-12 Yrs.	Sub-normal	Adult
Feeble-minded	4	30	41	25	0	0	0
Psychopaths	0	0	0	1	3	12	84

Here again the feeble-minded collect at the lower end of the scale, while the psychopaths collect at the upper end. 75% of the feeble-minded had a mental level below ten years; none of the psychopaths had so low a level of intelligence. 25% of the feeble-minded were between ten and eleven years; only 1% of the psychopaths had such a low level. None of the feeble-minded were above the eleven-year level; 99% of the psychopaths were above this level.

The fact is that a great majority of the psychopaths (84%) had a perfectly normal intelligence, while all of the feeble-minded suffered from an arrest of mental development prior to reaching adolescence; an obvious defect in their general intelligence, a dwarfing of their mental faculties, that prevented them from ever reaching the adult status of mentality. (To be sure, some of the feeble-minded possess markedly psychopathic traits. They still, however, come under the classification of feeble-minded).

We must think of the psychopaths in an entirely different light. We must consider these individuals in the light of adjustment of their personality, rather than in terms of general intelligence, and realize that their anti-social conduct is due less to their stupidity, less to their lack of understanding the demands of a normal social organization, and inability to foresee the consequence of their acts, than it is to a lack of ability to inhibit impulses, to assume responsibilities, to face difficult situations, to resist discouragements, and to coördinate properly a poorly balanced nervous mechanism. Their mentality is not defective in the usual meaning of the term, but is unstable, impulsive, vehement, in some cases erratic.

They are very emotional, easily upset, lacking in inhibitions, undertake many obligations, never fulfilling any; are restless, at times show great motor activity, become easily fatigued, and, occasionally, are violent and apparently insane under the influence of alcohol, drugs, or excitement. While under detention they clear up and give no evidence of a psychosis or mental defect, only to have another outbreak when things go wrong in their environment. In institutions they give more trouble than any other group, and seem little modified by such treatment. At times they become absolutely unmanageable, and because of the fact that they seem so erratic and uncontrollable, they are often considered insane, and are transferred to insane hospitals.

The fact is, these individuals are better handled outside, except in cases where vicious and markedly delinquent traits render their incarceration necessary. They react to discipline very poorly—one may say violently—but much progress can be made in the way of training them through an intelligent effort to understand their motives and to secure their own coöperation in undertaking to study their weaknesses and to educate their inhibitions; in short, a development of sufficient self-control to counteract their impulsive tendencies.

SUMMARY.

In this study a comparison was made of feeble-mindedness and psychopathic personality under six main headings: grade reached in school, industrial efficiency, number of arrests, probation, penal treatment, and mentality. It appeared that there was a marked difference in the way these two types reacted, the deviation being such as to justify their consideration under separate categories for practical court work.

The feeble-minded could not make the required progress in school. They were incompetent, impotent, and dropped out, unable to finish grammar school. The psychopaths were able to make better progress, in the majority of cases finishing grammar school, many going on to high school, some graduating and going on to college.

Comparing them on the basis of industrial efficiency, it was found that seven times as many psychopaths were steadily employed as feeble-minded. The majority of the feeble-minded were not self-supporting, while the majority of the psychopaths were.

The feeble-minded were arrested about five times as frequently as the psychopaths, though it was explicitly stated that such facts should not be construed as indicating comparative criminality of the two types. It could be interpreted only as indicating that the machinery of the court was being employed more frequently for this group.

On probation the psychopath is twice as good a risk as the feeble-minded. It was thought that in general terms more could be done for the psychopath through probation than through any other method, provided an effort be made to guide his treatment by a knowledge of his peculiar personality.

The attitude of the court was in favor of this, when the feeble-minded received twice as many sentences, in proportion to number of arrests, as the psychopaths.

The most important link in the entire chain was found in the table of mental level. None of the feeble-minded had a mental level above eleven years. All of the psychopaths—with one exception—possessed a level of intelligence above eleven years. The feeble-minded collect around the lower end of the scale of intelligence, while the psychopaths collect around the upper end. We are to think of the feeble-minded in terms of development of general intelligence. A halt in development occurs prior to their reaching adolescence. We are to think of the psychopaths in terms of adjustment of their peculiar personality. Their intelligence itself is not at fault. They are unstable, impulsive, emotional, and poorly balanced. Contrasted with the normal individual, whose mental faculties work in harmony, are correlated and well-balanced, the mental machinery of the psychopath is discordanced, dis-related, and poorly balanced.

In the light of foregoing facts, it would seem safe to conclude that any form of social treatment that does not take into consideration the essential differences in mental make-up existing between these two types must eventually fail in the practical solution of their problems.

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HEARING TESTS FROM A PRACTICAL STANDPOINT.*

BY GEORGE L. RICHARDS, M.D., FALL RIVER.

HEARING tests are as old as modern otology, and have been written about at great length by many authors, both in textbooks and in monographs. They have been so much elaborated and made so complex that the busy man is often tempted to omit or abuse them. I desire in this paper not to discuss these tests in detail, but to suggest a plan that is at once practical and at the same time sufficiently scientific to give satisfactory results. This procedure is neither unduly time-consuming to the physician, nor fatiguing to the patient, both of which are true when a complete functional test by all the well-known methods is made.

Many years of experience have taught me that hearing tests are largely neglected because they take up so much time. We learn with the aid of a single tuning fork and a few simple tests to make a fairly accurate snap diagnosis as to whether we are dealing with a middle or internal ear lesion, without differentiating with great accuracy as to the extent and location of the lesion, and with this are apt to be content.

This would not be so bad were it not that a prognosis based on these tests alone might have been somewhat modified had a more thorough functional examination been made before and after treatment.

The occasional case, where there may be islands or gaps of hearing, and medicolegal or otherwise exceptional cases, may require a complete functional examination with all the means at our command. Whether this will or will not be necessary will be evident to the examiner.

The object of any hearing test is to determine the quantity and quality of the deafness present and the location of such lesions as far as these tests can enlighten us.

The normal range of hearing for the human ear varies from 16 to 32 (seldom below 32) vibrations a second (the so-called lower tone limits), up to 30,000 to 42,000, the upper tone limit. We are taught that in middle-ear deafness there is an impairment in hearing range for the lower tones, while the higher tones are but little or not at all affected, and that in nerve deafness there is impairment of hearing power for the higher tones, while the lower tones are relatively less affected. When both are affected there is a diminution of hearing power for the entire range.

The apparatus required for these tests is a set of the usual C tuning forks, with the addition of C 64, two A forks, a stop watch, with a clear, well-defined click, a Bárány noise machine, an Edelmann-Galton whistle, a long six-foot speaking tube, the observer's voice, and a room with as great a length and with as much freedom from external noises as the examining place affords.

Tuning Forks. The individual set used must be tested out on a number of normal ears, for both air and bone conduction, and these recorded as the fixed fractions for these forks (for they will not give the same results in any two sets); even then there is apt to be a distinct source of error, since the force of the blow on the fork will vary with the habit of the examiner using them; hence it is desirable to have as definite a method of striking these forks as possible in order to get a uniform blow. High forks with hammer attachments are in the market, but it is easier to strike high forks uniformly than it is the low ones.

The low fork should be used by bringing the prongs together with the fingers, then with a sliding motion quickly letting go. This gives a fairly uniform effect; the higher forks can be used in the same way or may be struck on the knee or the heel with a quick but not too strong blow. Writers have had much to say about the elimination of overtones. This is not an easy task, even with weighted forks, nor is it particularly necessary since the overtones disappear before the real tones, so that our measure of value is fairly accurate even in their presence, and I disregard them.

Because of the difference in striking the blow to the fork it is desirable that the same examiner make the individual tests both before and after the treatment. This especially applies to those of us who have assistants or associates. Do not make the test yourself before the treatment, and then ask another to do it after the treatment.

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* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-eighth Annual Session of the American Medical Association, New York, June, 1917.

To use the forks, hold the stop watch in the left hand, and as soon as the fork is no longer heard, press the stem of the watch, allow the numerator of the fraction to apply to air conduction and the denominator to bone conduction. After putting the C fork in vibration, place it before the ear about one inch from the orifice, being careful to avoid contact with hair, face or clothing, and in such manner that the two prongs will be parallel and not superimposed one above the other; then place the stem of the fork on the tip of the mastoid and ask the patient which is louder, and you have at once your probable Rinné.

Then starting the tests fork by fork, record both bone and air conduction with the stop watch, having the patient say "gone" when he no longer hears it. Use C 64, C 128 and C 512 on each ear as routine.

A clear brain and a considerable degree of concentration on the part of the patient being examined are needed for a satisfactory examination. Here is where the results are often uncertain. Tabulated and compared with the normal range, these tuning forks give much valuable information, but one can never assume that they are absolutely accurate, nor is a change of a few seconds either way at a subsequent visit of any great significance. If performed sufficiently often they will give us rather definite information as to the progress of the case.

The Rinné test has already been determined by the tabulated tuning fork reactions; the Weber, Schwabach, the Gelle tests, while of scientific interest, may be disregarded in the present plan. I have never found them of much aid. Should the test up to the present point have shown probability of nerve deafness, we use fork C^3 and C^4 and the Edelmann-Galton whistle; the latter, with the aid of the table provided with each instrument, gives with a considerable degree of accuracy the upper tone limit. It is sometimes difficult, in the case of the Galton, to teach patients to understand just what is meant by the difference between the whistle and the puff, but if the whistle is placed behind the ear, so that the column of air cannot be felt, this difficulty is overcome. The same is also true when using low forks, especially for bone conduction, as it is often troublesome for the party under examination to distinguish between the hearing of the forks and the feeling of the vibrations, or feeling before the ear the movement of the air current which the fork has set in motion.

Voice. Except in cases of deafness of considerable degree, few offices are large enough to make satisfactory tests by the ordinary spoken voice. Under favorable conditions this should be heard from 130 to 150 feet, or even farther, as the accentuated whisper should be heard as far as a hundred feet, while the typical whisper may be heard from 60 to 75 feet. As in most cases more or less outside noises must be taken into consideration, the average person under average conditions will scarcely hear the whispered voice 60 feet. The United States army requires a hearing distance for the whisper, of 20 feet. This is the ordinary whisper, for which the residual air in the lungs is to be used. Practice will enable one to whisper with a good degree of uniformity both in volume and pitch. For this test one ear is closed by the moistened finger in the external canal or by some sort of sound-closing apparatus, like a small moist rubber ball or a pledget of moistened cotton placed in the ear and pressed firmly against the antitragus. Even so, it is almost impossible to entirely close off the sound to the other ear, which, if it happens to be good, will be interpreted by the patient as being the ear under examination, and so be misleading. To offset this, Bárány introduced the noise machine which, when the tip is introduced into one ear, so confuses the sound to this ear as to cut out other sounds.

In my experience this apparatus has proved useful, but it has seemed sometimes to so confuse the individual as to prevent an accurate test of the ear under examination, the ear hearing both the noise machine and the fork or the voice, as the case may be, but both with less accuracy. To offset this I have tried having an assistant massage very rapidly the antitragus with an in-and-out motion over a bit of moist cotton in the external canal. This rather effectually cuts out any recognizable noise to that ear, and is not as confusing to the ear being examined.

The ear to be tested is turned toward the examiner, and the patient's eyes closed or so directed that he cannot see the speaker's lips. This seems to me a fairer test than standing behind the patient, as the external ear may more or less interfere with hearing. Some care should be used in the test words; pure vowels like *o, ah,* and *e* are heard farthest, but become somewhat blurred in a whispered speech, while consonants change but little. The *"h"* aspirate is the lowest and feeblest sound, being, according to Wolf's experiments, heard about one-thirtieth as far. The consonants *v* and *k,* hard *g* and *d* are heard about one-sixth as far. I use single common words and numbers, going from simple monosyllables to polysyllables. I find the *n* sounds, seven, nine, eleven, easy to recognize, while the sounds like sixty-six, seventy-seven, are more apt to be answered incorrectly. These numbers are carried up to three syllables. I am particularly fond of the numbers 100, 120, 146, etc.; next I ask questions, instructing the patient not to answer the question, but to repeat it; then I proceed to ask unexpected ones such as, "Have you had your breakfast?" "How old was Methuselah when he died?" and the like. The average of these will give about the proper distance for the whispered voice. All tests are begun at a distance beyond which you expect the person examined to hear. The conversational voice is always used when the deafness is of such degree as to warrant tests. This distance is recorded on the history chart for comparison with future tests.

Watch Test. Use the stop watch with a fairly sharp tick; this will take the place of the Politzer acoumeter, which can be discarded. Test out the individual watch on a number of normal persons to get its approximate range, and always use the same one, as no two will have the same hearing distance. The stop itself ought to have a sharp click, for this will aid us to determine whether or not the watch has really been heard, as the click will be heard at a greater distance than the tick. Patients sometimes say they hear when the click is sounded, believing that the watch has been started again by a sort of off-and-on mechanism, whereas the interval is always one, two, three, stop—reverse pointer, start. Replies to this as to all hearing tests are apt to be somewhat misleading, hence the need of so many different ones. For the ordinary case the tests above described are all that are necessary.

There remains the occasional case where one ear is so deaf that it is difficult to exclude the good ear sufficiently to determine whether we have much of any hearing, and just how much in the defective ear, all the tests described being perhaps more or less interpreted by the good ear. To assist in such cases I use a silk-covered speaking tube, with the other ear as closely stopped as possible. One can determine by speaking through this tube with a clear, distinct voice if there is any hearing. It is best to hold the edge of the funnel connected with the speaking tube against the chin rather than cover the mouth with it. The sounds are heard more clearly when it is used in this way. Next the noise machine is placed in the good ear, and the speaking tube used in the same way.

The Stenger test is used for the same purpose, and is also of value where malingering is suspected. Two A forks are struck at the same time, and with the patient's eyes closed by bandage so he cannot see the movements of his examiner, the forks are alternately advanced toward and from each ear, one in front of the malingering ear, the other in front of the non-malingering ear; only the fork will be heard which is nearest the ear.

The same test is also repeated with the eyes open, and the results compared; if the patient continues to say he hears this in the same ear as it approaches the other ear then there is a chance of simulation. The examination for recruits in the present war will require, on the part of the examiner, skill in detecting malingering. In bilateral deafness the normal ear is excluded with greater difficulty the higher up the musical scale is ascended.

All distant tests must be made with the voice as we approach the patient, and repeated until the test word is heard. When we draw away from the patient, speaking until he no longer hears, the apparent hearing distance will be greater, since the hearing having once been called into action, responds to a sound at greater distance than it would as an initial sensation.

If in doubt whether the ear under examination hears, close the one being tested, tightly, and then if sound is still heard it must have been from the good ear.

HEARING TESTS IN CHILDREN.

Here we contend with two principal difficulties: the unwillingness or the inability of the child to answer correctly. The little patients tire easily, hence the examination should be made as quickly and pleasantly as possible. When using questions it is desirable to use such as will be normally answered in the affirmative by a nod of the head, or else something which demands movement on the child's part. Prolonged examinations of children under 10 years are apt to be unsatisfactory. If the child is very deaf it will not be easy for him to distinguish between hearing a sound and feeling a vibration. Many children cannot be accurately tested until the third or fourth year in school.

Labyrinth tests do not fall within the scope of this paper, other than to mention that when it seems necessary to test the function of, and to determine the normal nystagmus we have found the caloric test (cold water) easier to perform, sufficient for diagnosis, and less troublesome to the patient than the turning tests. We do not as a rule use it where there is drum perforation.

U. S. ARMY TESTS.

For examination of the aviation corps and for the general hearing tests in the recruiting service of the United States Army, the method is as follows, so far as hearing tests are concerned:

Auditory acuity less than 20/20 in either ear is disqualifying. To obtain uniform results, the hearing of each ear is tested separately with the candidate standing 20 feet from the examiner and facing away from him 3 feet from the wall; this adds one-third of the ordinary distance at which a whisper would be heard were the person facing the examiner. An assistant tightly closes the ear not under examination by pressing the ball of the moistened index finger in the external meatus, and the examiner then exhales, and with residual air whispers various words and numbers which the candidate is required to repeat. This test should be repeated by using the ordinary low voice. The result of each test is recorded by using a fraction which has the normal test distance in feet (20) for the denominator and the distance through which the test sound is correctly heard as the numerator. In testing the hearing by the watch, an Ingersoll dollar watch is used. First determine by actual trial the average maximum distance at which five men with apparently normal hearing and normal *membranae tympani* hear the watch when their eyes are closed; this approximates 40 inches. In recording the result, this number in inches is taken as the denominator, and the distance at which the candidate hears the watch, with one ear occluded and both eyes closed, as the numerator.

A functional test for the labyrinth is made as follows: The nystagmus, the past-pointing, and the falling after turning are tested both as to direction and amount. The testing chair must have a head-rest which will hold the head 30 degrees forward and a foot-rest and a stop pedal.

Spontaneous nystagmus is tested by fixation of a point beyond the normal hearing distance. Then the head is inclined 30 degrees forward and the candidate is turned to the right, with the eyes tightly closed, ten times in exactly twenty seconds. The instant the chair is stopped, click the stop watch and the candidate opens his eyes and looks straight ahead at some distant point. There should occur a horizontal nystagmus to the left of twenty-six seconds' duration, and the candidate then closes his eyes, and is turned to the left in the same manner. There should occur a horizontal nystagmus to the right of twenty-six seconds. A variation of eight seconds is allowed.

Past-Pointing. The patient sits in the chair, eyes tightly closed, and faces the examiner and touches the examiner's forefinger in front of him, raises the arm in the perpendicular position, and attempts to find the examiner's finger, both right and left. Normally, the person will always find the finger. The patient is now turned ten times to the right for ten seconds, the chair is locked in position, and the person to be examined told to touch the finger in the same manner, right, left, right, left, right, left (three times). Normally the finger will point to the right, the past-pointing will be less each time it is tried, and on the fourth turn the finger should be touched accurately.

The same experiment is then performed by turning to the left, the patient always past-pointing in the direction of the turning. Finally the head is inclined 90 degrees downward and the patient turned to the right five times in ten seconds. On stopping, the patient raises the head, and he should then fall to the right. These test the vertical semicircular canals. He is then turned to the left in the same manner and falls to the left.

* * *

Exemptions for Mental Disabilities.—Surgeon-General Gorgas is making arrangements to provide each base hospital with a neuro-psychopathic clinic to eliminate those mentally unfit from the ranks of the army.

AN EPIDEMIC OF DYSENTERY AT THE BOSTON STATE HOSPITAL, DUE TO A MEMBER OF THE PARATYPHOID-ENTERITIDIS GROUP.

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[From the Laboratory of the Boston State Hospital.]

(Continued from page 180)

VI. THE LEUKOCYTIC REACTION.

Gay and Claypole[10] in their experiments in typhoid immunization found that a specific hyperleukocytosis, preceded by a leukopenia, was produced in typhoid immune rabbits by inoculations with typhoid vaccine, and that the important cell in the gain was the polymorphonuclear The leukocytic response was more rapid and rose to a greater height in the immunized rabbit than in the normal animal. H. I. McWilliams,[11] in a more recent report of similar experiments with rabbits, noted a hyperleukocytosis which was not of a higher grade in the immune than in the non-immune animal.

Both Gay[12] and McWilliams[13] have described the leukocytic reaction following injections of vaccine in typhoid fever. A chill and rise in temperature are coincident with a leukopenia shortly after the inoculation, and a few hours later, with the lowering of the temperature and a lessening of symptons, there is a high-grade hyperleukocytosis. The relation of the hyperleukocytosis or "leukocytic crisis" to the freeing of antibodies indicates the possible value of these studies in vaccine therapy and prophylactic immunization.

Although our examinations have been limited to human cases and have not the exactness of results obtained in animal experimentation, they have a certain clinical value, because it has been impossible to observe these cases over a number of months.

A polymorphonuclear leukocytosis, both actual and relative, was demonstrated in one protracted case (M. G.) during the first outbreak of dysentery, after a repeated therapeutic dose of the dysenteric vaccine. Six hours after a subcutaneous injection of 75,000,000, the total count rose from 6,400 to 19,400 and the polymorphonuclears from 56% to 76%, with a loss of eosinophiles. No constitutional reaction followed successive small doses in this patient, although there was an apparent improvement in symptoms.

A polymorphonuclear leukocytosis was observed in a second case eighteen hours after an initial prophylactic inoculation of 500,000,000 and six hours after the onset of a severe constitutional reaction, with fever and vomiting. Total count 18,800; polymorphonuclears, .92;

lymphocytes, .08; large mononuclears, transitionals and eosinophiles, 0. This was the only count made in this case. There is no record 11 months later that this patient has had an attack of the disease.

Because of these isolated observations, it seemed worth while to study the leukocytic reaction more carefully, and during the seventeen months following the first outbreak several series of examinations were made, including one woman and four men who had had neither the disease nor prophylactic treatment, and four women who had had the disease from nine to seventeen months previously. Subcutaneous injections of vaccine were given for two or three successive weeks in doses as in prophylactic treatment, beginning with 500,000,000. In two cases the counts were taken at two-hour intervals during the first 26 hours after the inoculation. In all the other cases, countes were taken during either the first twelve or the second twelve hours at one-half, one-hour, or two-hour intervals.* Differential as well as total counts were made, and a control count was made in each case. There was no constitutional reaction observed in any of these cases and the local reaction was moderate.

The leukocytic reaction consisted of a hyperleukocytosis, with the highest count rising but little above twice that of the normal count for the individual and a relative increase in polynuclears at one or more periods during the following twenty-four hours, this relative increase not always being synchronous with the highest total count.

The reaction was somewhat more marked after the second or third inoculation than after the first, except in one case in which the vaccine was injected shortly after a recurrent attack. In this case the reaction was greater after the first injection of 500,000,000 two days after the attack than after the second inoculation of 1,000,000,000, seven days later. One case (M. G.), referred to above as showing marked reaction to vaccine therapy on the first attack, showed a moderate reaction both in total and differential counts following an inoculation of 500,000,000 nine months later; and on the third day of a recurrent attack, seventeen months later, gave evidence of a reaction only in a relative increase in polymorphonuclears following an injection of 500,000,000. The diarrhea in this last instance ceased a few hours after the inoculation and there was no evident constitutional disturbance.

There is no record that the individuals chosen as normal cases in this series of examinations have had an attack of dysentery or diarrhea.

In comparing the leukocytic reaction with the clinical history in these cases the following conclusions have been made:

1. The stronger normal individuals show more reaction to subcutaneous injections of vaccine than the weaker ones who have had the disease and recurrent attacks.
2. The leukocytic reaction for the individual is more marked during or immediately after an attack of the disease and diminishes with recurrent attacks. This corresponds to the clinical observation that the resistance of the individual to the disease is lessened by a previous attack.
3. The fact that there may be a polymorphonuclear reaction to a subcutaneous injection of vaccine, coincident with the cessation of a diarrhea, would indicate the use of vaccine therapy. In the few cases in which this treatment has been given, the rssults have been favorable for a recovery from an attack.

VII. BACTERIOLOGY.

The method of isolation of the organism was that usually employed for bacteria of intestinal infections. A loopful of the fresh stool was put into a broth tube, portions containing blood or mucus, if present, being selected. After two hours' incubation, surface inoculations were made on Congo red lactose agar plates. The organism predominated on the plates during the acute stage, and was frequently present in almost pure culture. It was found as long as blood and mucus persisted and for some days after the stool began to be formed, but was not isolated after the acute stage, in cases either that recovered or that came to autopsy.

On Congo red plates at the end of twenty-four hours the colonies were round, raised, with smooth edges, translucent gray, averaging ½ mm. in diameter. During the second twenty-four hours they became an opaque gray, and increased to about 1 mm. in diameter. They did not form acid.

The organism when first isolated appeared as a small, short, thick Gram-negative bacillus. After artificial cultivation longer forms appeared. When first isolated it appeared nonmotile, but after frequent replants it took on a moderate motility. It grew quickly and well on the usual media.

Cultural Characteristics.—Agar—a raised, moist, gray streak with wavy borders. The growth was delicate at first, but after several replants became heavier and whiter.

Broth—a light diffuse cloud with somewhat ropy sediment.

Gelatin—not liquefied.

Litmus milk—the results were variable.

An acidity, usually slight, developed slowly (within 2-3 days) and in some cultures remained permanent as long as the tubes were observed (four weeks). Other cultures after an initial acidity became somewhat more alkaline at the end of 3-4 weeks.

Indol—tested in Dunham's peptone solution at the end of four days. One half the strains gave a negative, the other half a faint positive reaction.

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* A number of these counts were made by Mr. J. C. Rock of the Harvard Medical School.

Fermentation Reactions were tested qualitatively, in Hiss' serum water, and quantitatively in sugar-free broth containing one per cent. of the substances giving an acidity in the former medium. The substances used were dextrose, lactose, saccharose, maltose, dextrin, salicin, glycerin, and mannite.

TABLE I.

QUALITATIVE REACTIONS OF EPIDEMIC ORGANISM.

LITMUS MILK	INDOL	FERMENTATION REACTIONS (LITMUS SERUM WATER)							
		DEXTROSE	LACTOSE	SACCHAROSE	MANNITE	MALTOSE	DEXTRIN	SALICIN	GLYCERIN
Acidity, slowly changing to alkalinity in some strains; permanent acidity in others.	0 or faint +	+ gas	0	0	+ gas	0	0	0	0

TABLE II.

ACIDITY IN ONE PER CENT. SUGAR-FREE BROTH.

CULTURE	DEXTROSE	LACTOSE	SACCHAROSE	MANNITE	MALTOSE	SALICIN	GLYCERIN
M	+3.4	—0.8	alk.	+3.4	+0.2	alk.	+1.3
B	+1.7	—0.4	+1.8	+2.8	+0.1	"	+1.9
P	+4.3	—1.0	alk.	+3.2	+0.3	"	+0.8
A-15-24 Heart	+1.9	—0.2	"	+2.4	+1.1	"	0.0
L	+3.4	—0.9	"	+3.2	+1.1	"	alk.
W	+2.2	—0.8	"	+3.5	0.0	"	+0.8
Paratyph. A	+3.1	0.0	"	+3.7	0.0	"	+1.2
Paratyph. B	+2.8	0.0	"	+4.0	0.0	"	+1.5
B. suipestifer Ark.	+2.0	—1.3	"	+2.6	+0.3	"	alk.
B. suipestifer Md.	+1.9	—1.2	"	+3.0	+0.5	"	"
Paracolon No. 17	+1.5	—0.7	"	+2.8	+0.3	"	"
Paracolon No. 26	+1.7	—0.6	"	+3.0	+0.4	"	+1.5
B. enteritidis	+2.0	0.0	"	+3.0	0.0	"	+1.0

The qualitative results are given in Table I and the quantitative in Table II. The only substances broken down by all strains are dextrose and mannite, the former usually and the latter always with gas production. Saccharose and glycerin were slightly affected in isolated instances. Salicin, dextrin, and maltose were not attacked.

A strain of paratyphoid *A* and *B*[*], two each of B. suipestifer[†] and "paracolon bacilli,"[*] and one of B. enteritidis—Gärtner[†]—were studied for comparison, and the results are included in the quantitative table.

The colon-typhoid group is divided primarily into a lactose fermenting (B. coli) and a lactose-negative group. The latter is again subdivided according to the action on mannite; no change, B. dysenteriae Shiga; acid only, B. typhosus, B. dysenteriae Flexner; acid and gas, paratyphoid-enteritidis group. The members of this last group are negative to saccharose and salicin and must be distinguished one from another by their agglutinative affinities. The present organism falls in a broad way in the paratyphoid-enteritidis group, as it is a lactose-negative bacillus, forming acid and gas in mannite, and not acting on saccharose and salicin. It differs from the generally accepted characters of the group, however, in a number of particulars. A characteristic of the strains isolated in this epidemic is the variability of their action in milk and in the production of indol. Each strain has retained its original characteristics in these respects after more than a year of artificial cultivation. The paratyphoid-enteritidis group is supposed to form no indol, to ferment maltose with gas formation, and paratyphoid *A* to give a permanent acidity in milk while the other members of the group give an acidity followed by alkalinity.

Recently, however, Krumwiede, Pratt and Kohn[14] have questioned the value of litmus milk as a medium for differentiating paratyphoid *A* from B, as in a series of representations of the group they found that the difference was quantitative only, and that there were numerous intermediate degrees of reaction.

The paratyphoid-enteritidis group is admittedly especially complex and unstable, and the question of the identity or mutual relationships of its members is very confusing and is still unsettled. The cultural and chemico-biological characteristics of various members of the group are essentially the same, so that subdivision according to these is impossible. Agglutination reactions,[15] however, while demonstrating the near relationship of members of the group, do permit a further differentiation into a paratyphoid B and a "Gärtner-enteritidis" sub-group. Gärtner antisera do not agglutinate paratyphoid B bacilli, and conversely B. antisera do not influence Gärtner bacilli. Complement-fixation also shows a separation of the group into the same subgroups. Paratyphoid *A* seems to go in the Gärtner, and B. suipestifer in the *B* subdivision. Paratyphoid *B* is quite uniform in cultural and serological reactions, while the Gärtner group is more irregular in both respects.

In addition, other strains have been described which agree in most cultural characteristics with the group, but are not agglutined by paratyphoid *B* or enteritidis antisera. Immune sera for these strains usually agglutinate only their homologous organisms. These may represent transitions between the two subdivisions. Certain of these cultures have been described under the title of paratyphoid *C*.

As to the normal habitat of members of the group: according to Bainbridge[2] true paraty-

[*] Obtained from the American Museum of Natural History.

[†] Obtained from the Harvard Medical School. B. suipestifer Arkansas and Maryland.

phoid *A* and *B* are never found except in connection with human disease, while the other members of the group are associated with animals. The normal habitat of B. suipestifer is the intestine of mice and pigs. B. enteritidis is frequently present in the intestine of healthy rats, and this animal is an important source of the organism. The bacillus also causes an infection of cows and calves. The organism has been the cause of frequent epidemics of meat poisoning, the meat either coming from infected animals, or having been contaminated after slaughter, presumably by rats.

VIII. AGGLUTINATIONS.

A series of agglutination reactions was done, using the sera of recovered and vaccinated patients and of immunized rabbits with the epidemic strains and also with several representatives of the paratyphoid-enteritidis group which had been studied culturally; also the epidemic strains with rabbit antisera for the same representatives of the group.

The points in view were: the extent of agglutinin formation in the disease, its relation to the type of the disease, persistence of agglutinins after recovery and prophylactic vaccination, and the placing of the epidemic organism in the paratyphoid-enteritidis group.

One or more tests were made on 78 persons. The serum of a normal non-exposed person was used as a control.

The reactions were done by the macroscopic method, using formalized cultures as antigens. For the homologous antigen with patients' sera a mixed antigen was used, made of four strains isolated from the feces; two from the heart's blood and one from the intestinal wall of fatal cases.

All the dysentery cases tested gave a positive reaction in dilutions varying from 1/10 to 1/120. Twenty seven cases of diarrhea occurring in patients and employees at the West Group during the outbreaks of dysentery also agglutined in dilutions varying from 1/20 1/100.

Agglutinin formation in the disease, as shown by these results, is very moderate. The highest complete reaction obtained was 1/120. The majority of the sera obtained to within four weeks after onset agglutinated completely only to 1/40, smaller numbers to 1/80 and 1/100, a few only 1/10 and 1/20 (see Chart 2). As to the relation between the type of the disease and the strength of the agglutination reaction, Chart 2 shows that reaction in high dilutions were more frequent among the dysentery than among the diarrhea cases.

Repeated observations on 12 patients who had a single attack (see Table III.) show that there is a rapid drop in the titre during the first few weeks, in some cases a drop to 1/2 or 1/5 between the 3d and 4th week, and that agglutinins persist (at a low level) in some cases for a considerable time,—as long as 17 months in one case and 14 months in two others, although single negative results appear at 5 to 11 months.

TABLE III.

PERSISTENCE OF AGGLUTININS AFTER A SINGLE ATTACK OF DYSENTERY.

Case	Time between Onset and Test	Highest Complete Reaction	
M. Br.	3 wks.	1/40	
	10 mos.	1/20	
	14 "	1/10	partial
Wm. B.	3 wks.	1/80	
	5 mos.	1/20	
	17 "	1/10	partial
M. Cl.	3 wks.	1/80	
	4 "	1/40	
	5 mos.	1/20	
Wm. Cu.	3 wks.	1/100	
	4 "	1/20	
	5 mos.	neg. 1/10	
C. F. H.	3 wks.	1/100	
	4 "	1/80	
	10 mos.	1/10	
	14 "	1/10	
M. Ga.	3 wks.	1/100	
	5 mos.	1/40	therapeutic vaccine treatment
R. Pr.	2 mos.	1/40	
	6 "	1/20	
Th. S.	2 wks.	1/100	
	3 "	1/80	
	2 mos.	1/20	
	10 "	1/20	
	14 "	1/20	
Geo. H.	3 "	1/20	
	11 "	1/10	partial
M. McD.	2 wks.	1/100	
	3 "	1/40	
	13 mos.	1/10	
M. Don.	2 wks.	1/40	
	6 mos.	1/10	
	11 "	1/10	
Ger. W.	2 wks.	1/40	
	8 mos.	1/20	
	11 "	neg. 1/10	

After prophylactic vaccination repeated agglutination tests were made on 10 patients at intervals up to 10 months. In the majority of cases the titre within a month after inoculation ranged from 1/80 to 1/150, but in one case was 1/20. Values of 1/20 and 1/10 were usually obtained at 5 to 6 months and 1/10 at 10 and 11 months.

No extended observations on the persistence of agglutinins after paratyphoid infections are available, although, on the strength of tests on single cases, they are said to disappear rapidly. Dreyer[4] has found agglutinins for *B* are always high, while for *A* they are low, after either the disease or vaccination, as compared with *B* or typhoid.

The following antigens were also tried out with a limited number of patients' sera and with rabbit serum for the epidemic strains: paratyphoid *A*. and *B*. B. suipestifer Arkansas, B. enteritidis,* and the strain of paratyphoid *A* isolated in the hospital epidemic of 1910.

TABLE IV.

SERA OF RECOVERED PATIENTS WITH DIFFERENT ANTIGENS.

Patient's Sera	Dilutions	Mixed Strains B. S. H. Epidemic	Paratyphoid A. N. Y.	Paratyphoid B. N. Y.	B. Enteritidis	B. Suipestifer Ark.	Paratyphoid A. B. S. H.
O'B	1/10	+	+	±	+	+	±
	1/20	+	—	±	+	+	±
	1/40	+	—	±	+	±	±
	1/80	+	—	±	+	±	—
	1/100	±	—	±	+	±	—
W	1/10	+	—	—	+	+	∓
	1/20	+	—	—	+	+	∓
	1/40	+	—	—	+	+	∓
	1/80	±	—	—	+	+	∓
	1/100	±	—	—	+	±	∓
McD	1/10	+	±	—	+	±	±
	1/20	±	±	—	+	∓	±
	1/40	±	±	—	—	—	±
	1/80	±	±	—	—	—	±
	1/100	±	±	—	—	—	—
M	1/10	+	∓	—	..	±	—
	1/20	+	—	—	..	∓	—
	1/40	+	—	—	..	∓	—
	1/80	±	—	—	..	∓	—
	1/100	—	—	—	..	—	—
O'M	1/10	+	—	—	..	—	—
	1/20	±	—	—	..	—	—
	1/40	±	—	—	..	—	—
	1/80	±	—	—	..	—	—
	1/100	±	—	—	..	—	—
C	1/10	+	—	±	..	+	∓
	1/20	+	—	±	..	±	∓
	1/40	±	—	—	..	±	∓
	1/80	±	—	—	..	±	∓
	1/100	±	—	—	..	±	∓
S	1/10	+	+	+	..	+	+
	1/20	+	±	+	..	+	±
	1/40	±	±	+	..	+	—
	1/80	±	—	—	..	±	—
	1/100	±	—	—	..	—	—
Normal	1/10	±	—	∓	+	—	∓
	1/20	—	—	∓	+	—	∓
	1/40	—	—	—	—		—
	1/80				—		—

±=almost complete.
∓=trace.

The results with patients' sera, given in Table IV. show first, the presence of group reactions; second, the absence of strong reactions with paratyphoid *A* and *B*; third, the nonidentity of the present organism with the one isolated in the epidemic of 1910; and fourth, high agglutinations of two sera with B. enteritidis, although these results must be discounted to a certain extent by the reaction of the bacillus with normal serum. With stock paratyphoid *A* and *B* sera the epidemic strains reacted scarcely at all (partially at 1/10.)

TABLE V.

RABBIT ANTISERA WITH DIFFERENT ANTIGENS.

Sera	Dilutions	Mixed B. S. H. Epidemic	B. Enteritidis	B. Suipestifer	Paratyphoid A. N. Y.	Paratyphoid A. B. S. H.	Paratyphoid B. N. Y.
Rabbit › mixed strains of B. S. H. epidemic	1/10	+	+	+	+	—	+
	1/50	+	+	+	+	—	+
	1/100	+	+	±	±	—	±
	1/200	+	+	±	—	—	±
	1/300	+	+	±	—	—	∓
	1/400	±	+	±	—	—	∓
	1/500	±	+	±	—	—	∓
	1/1000	±	+	—	—	—	—
Rabbit › B. enteritidis	1/10	—	+	..	+	..	+
	1/50	±	+	..	+	..	+
	1/100	±	+	..	+	..	+
	1/200	—	+	..	+	..	+
	1/300	—	+	..	+	..	±
	1/400	—	+	..	+	..	±
	1/500	—	±	..	+	..	∓
	1/1000	—	±	..	±	..	∓
	1/1500	—	±	..	±	..	∓
	1/2000	—	±	..	—	..	∓
Rabbit › B. suipestifer	1/10	±	+	+	—	—	+
	1/50	±	+	+	±	—	+
	1/100	±	+	+	±	—	+
	1/200	—	+	+	±	—	+
	1/300	—	+	+	±	—	+
	1/400	—	+	+	±	—	+
	1/500		+	+	±	—	+
	1/1000		+	+	+	—	+
	1/1500		+	+	±	—	—
	1/2000		—	±	—	—	—
Normal Rabbit	1/10	—	—	—	—	—	—
	1/50	—	—	—	—	—	—
	1/100	—	—	—	—	—	—

±=almost complete.
∓=trace.

A rabbit was immunized with five subcutaneous doses of living broth culture of the same epidemic strains used for the mixed antigen. The antiserum (see Table V) agglutinated the homologous antigen completely at 1/300, and almost completely at 1/1000. It reacted with B. enteritidis better than with the homologous strains, giving a complete reaction at 1/1000. It agglutinated weakly (1/50 complete) paratyphoid *A* and *B* and B. suipestifer, but did not affect the Boston State Hospital strain *A*. These results agree in a general way with those obtained from patients' sera.

A strong anti-enteritidis rabbit serum was prepared, which agglutinated the homologous culture completely at 1/1500 and almost completely at 1/2000. Curiously, it reacted only slightly (partially at 1/50 and 1/100) with the epidemic cultures. It gave a moderate reaction with paratyphoid *B*, but with *A* reacted almost as well as with its own antigen.

A strong antisuipestifer serum (complete at 1/1500) also reacted only weakly with the epidemic strains, but as well with B. enteritidis as with its own antigen; it also agglutinated paratyphoid *B* in high dilutions (1/1000) but paratyphoid *A* only moderately.

(To be continued.)

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* For the sources and cultural characteristics of these strains see page 218 and tables III and IV.

Society Report.

NEW ENGLAND PEDIATRIC SOCIETY.

The forty-seventh meeting of the New England Pediatric Society was held in the Boson Medical Library, Friday, February 23, 1917, at 8.15 P. M., the president, **Dr. Maynard Ladd** of Boston, in the chair.

The following papers were read:

1. Certain aspects of epilepsy in children—George Clymer, M.D., Boston.
2. Hemorrhagic conditions, with especial reference to purpura—George R. Minot, M.D., Boston. Discussion opened by Beth Vincent, M.D., Boston.
3. Iliac adenitis and abscess—Charles J. Mixter, M.D., Boston.

General discussion of Health Insurance.

Dr. Clymer's Paper.

DISCUSSION.

Dr. Walter B. Swift: I should like to say a word about other phases. Epilepsy has a speech sign in it as one of the numerous aspects that should be brought to your attention. This speech sign is not one of the numerous signs that I have given out, but has been given to the literature by Dr. L. Pierce Clark of New York. It consists in a rather monotonous speech that lacks flexibility and is pitched a bit high, and is somewhat like this (illustrating).

You see that the sign is monotony, high pitch and lack of flexibility. For these reasons it has been termed the "plateau voice." Dr. Clark claims that it occurs in about 75% of cases and he has several times suspected epilepsy merely from the voice, and has found his suspicion confirmed by further examination.

There is another aspect that I wish to call your attention to, and that is that epilepsy is passing through a certain stage in medicine at the present time. It seems to be somewhat similar to the stage through which hysteria has passed. In the materialistic days, hysteria was considered to be the uterus wandering around in the inside. A number of years afterward, Janet, of Paris, a psychologist, saw the limitation of color fields and the lack of sensation and passing paralyses, and with his psychological eye came to the conclusion that hysteria was a limitation of consciousness. Then came Babinski,—he was a great observer, and he saw these same things, but he noticed that they could be made to disappear through the use of suggestion. He, therefore, claimed that hysteria *was* suggestion. Late years has come Freud, who has interpreted hysteria as the external manifestation of subconscious complexes and with him the medical world—at least half of it—has been swung over to this view.

What does all this mean? It means that certain men with certain training have shed the light of their training upon the same object and have made an interpretation of it from their own personal training. These are, in a great measure, the steps through which medicine, itself, in a large sense, has passed within the last hundred years. And this, also, is the condition in epilepsy at the present time. It is now passing from a somatic to a psychic interpretation. There are men arrayed on both the psychological side and the somatic side.

My own study in this field of epilepsy would incline me to follow a line of cleavage between these two. I see no reason why a psycho-somatic etiology cannot be proven. To do this we should look for something on the pathological side that is sufficient to cause the symptoms and the psychological appearances. I see no reason why the unit of etiology behind all these phenomena could not very well be hydrocephalus. Of course I know there are exceptions, but hydrocephalus has been found in many cases already. It is possible that in cases where it has not been found that there has been a partial hydrocephalus or a minutely located hydrocephalus, and that still further investigation may reveal that hydrocephalus itself, either large or finely located, is etiology enough, or that something that acts just like it may be etiology.

Sure it is that as we review all the symptoms and as we look at the anatomy of the ventricles where internal hydrocephalus occurs and see how pressure of too much fluid can vitiate the functions of nerve fibres and nerve cells, it is really quite plausible to think that after all the etiology may be nothing more than a large or small hydrocephalus.

Dr. Powers: There is not one thing in Dr. Clymer's paper which I can dispute and I certainly share with him his optimistic point of view. I think that by speaking in this optimistic way he is helping all of those who are treating epileptic patients.

In January, 1913, at the suggestion of Dr. Swift, I began to study the problem of the treatment of epilepsy. We had a great many cases of epilepsy at that time in the Nerve Clinic at the City Hospital, and they were looked upon as a nuisance. I think they are very interesting material to work on. I had some x-ray pictures of the skulls taken and bismuth x-rays of the intestines. The radiographs of the skulls showed nothing, but those of the intestines showed stasis. I placed the patients upon a diet which I consider merely a reasonable one for patients suffering from constipation and intestinal indigestion. They were given laxatives and abdominal massage, when it was possible. I believe that the massage helped them, but it is difficult to say how much. In giving abdominal massage, I begin at the caecum and massage the whole colon, spending more time on the hepatic flexure than elsewhere, because stasis most often occurs there, especially when the transverse colon is low and the hepatic flexure has, therefore, become a sharp angle. As it was not possible to give manual massage in all cases, I devised a method of self massage with wooden dumb bells, which has been taught to some of the patients. For a year I have treated nearly all cases without bromides, but have given sodium bicarbonate. I am not ready to say that I think that the bromides are useless, and think that I shall now begin to treat another series of cases with bromides for comparison with those treated without them. I have not used calcium lactate in many cases. I believe that the toxin which produces the attacks is an acid and that calcium lactate, acting as an alkali, may neutralize it. It is for that purpose that I use sodium bicarbonate. To treat a case of epilepsy requires a good deal of patience and time spent in inquiring into such commonplace matters as the diet which the patient is accustomed to and the kind and amount of exercise he has. This is not interesting to many neurologists and does not appeal to them.

Dr. Drowne: The details of the method which I am using are so involved, and the success depends in such a degree upon the thoroughness with which the details are carried out, and also the manual skill acquired, that it does not seem to me advisable to talk or write about them. They can be shown and the technic acquired by others.

Dr. Clymer (in closing): I should like to testify to the very good results obtained by Dr. Drowne in certain of his cases which I have seen. I think we should all be interested in the work he is doing.

HEMORRHAGIC CONDITIONS.

(Abstract.)

Dr. George R. Minot, Boston: Hemorrhagic conditions, due to a recognized abnormality of the blood, are associated with a diminished number of platelets, or with alteration of these elements or of other factors involved in the coagulation of the blood. The various types of purpura hemorrhagica are the conditions with diminished numbers of platelets, while in hemophilia, in certain types of cholemic hemorrhages, sepsis, and in some cases, at least, of melena neonatorum, the platelets occur in approximately normal numbers. In studying these conditions, it is necessary that the following tests be properly performed.

1. Enumeration or estimation of the platelets.
2. The bleeding time.
3. The coagulation time, with observations on,
   (a) the time of onset and termination of coagulation.
   (b) reclotting phenomenon;
   (c) retractility of clot;
   (d) firmness of clot;
   (e) effect of suitable amounts of calcium on the coagulation time.

The tests for prothrombin time, antithrombin and fibrinogen may be of value in certain instances.

Purpura hemorrhagica is that condition in which there is bleeding from one or more mucous membranes, and usually purpuric skin lesions. There is a marked diminution of the blood platelets, a delayed bleeding time, a normal or slightly delayed coagulation time, and a soft non-retractile clot. Purpura hemorrhagica is not to be confused with other types of purpura or scurvy which have an essentially normal number of platelets and no definite alteration of their coagulation factors. Purpura hemorrhagica may be an idiopathic disease or appear as a symptom secondary to some disease, as pernicious anemia, lymphatic leukemia, diphtheria, etc., etc. The idiopathic type may occur in the following forms:

1. Continuous—acute or chronic—acquired or congenital.
2. Intermittent.

In the former the platelets are continuously below normal, while in the latter they are below normal during the attacks only.

Idiopathic aplastic anemia has often undoubtedly been confused with purpura hemorrhagica, as both conditions present anemia and purpura. It may well be that these two conditions are not so distantly related as is perhaps evidenced by the fact that cases may be recognized that form an intermediate type of condition between them and suggest a partially depressed activity of the marrow which especially involves the platelet elements.

In typical aplastic anemia there is no evidence of regeneration of the erythrocytes, polynuclear leucocytes, or platelets, the blood elements originating in the marrow. In typical purpura hemorrhagica there is evidence of regeneration of erythrocytes and polynuclears but not of the platelets, though they may be formed as normally from the megakaryocytes of the marrow but rapidly destroyed in the circulation.

Diminution of platelets and thus primary or secondary purpura hemorrhagica may be due to:

1. Destruction or depressed activity of the megakaryocytes with or without similar action on the other elements of the marrow; by some unrecognized or recognized toxin, or by congenital absence of these elements.
2. Displacement of the megakaryocytes by abnormal cells, as occurs in lymphatic leukemia, pernicious anemia, metastatic tumors, etc.
3. Destruction of platelets in the circulation.

Hemophilia occurs in males only and is usually hereditary. Hemorrhages into muscles and joints are frequent. Purpuric skin lesions probably never occur. The blood findings are in contrast to those of purpura hemorrhagica. The platelets occur in essentially normal numbers, but are physiologically qualitatively defective. The bleeding time is essentially normal. The clot is retractive and firm. The coagulation and prothrombin time are usually much delayed. One must, however, note that some cases have but a very slightly delayed coagulation time or rather a delayed time demonstrated only by refined methods or by demonstrating the reclotting phenomenon.

In melena neonatorum there occurs a delayed, often markedly delayed, coagulation time, perhaps associated with prothrombin alteration or deficiency.

The one condition where there is a marked increase of antithrombin is in experimental peptone poisoning.

Diminution in the amount of fibrinogen as a cause for hemorrhages is to be found in conditions in which the liver is severely damaged, as in phosphorus and chloroform poisoning and far advanced atrophic cirrhosis; though diminution of platelets and perhaps a fibrinolytic ferment play a part in this latter condition.

Certain cases with defective bile secretion or biliary fistula may give some disturbance of liver function which affects the coagulation factors and causes hemorrhages.

The lack of calcium available for purposes of coagulation in the blood is probably wholly in some and partly in other instances accountable for the hemorrhages seen with certain cases of prolonged obstructive jaundice. Instances of actual diminution of calcium as a cause for hemorrhage are notably rare.

The administration of calcium for therapeutic purposes is indicated only in those cases associated with diminished amounts of either available or total calcium.

The best treatment for the other hemorrhagic conditions is a suitable amount of transfused blood from a donor of the same isoagglutination group. If it be to replace diminished or defective platelets the effect will last as long as the life of the platelets, *i. e.,* about three to five days, though in some instances a rapid destruction of such platelets seems to occur and the effect is then shorter. A permanent or marked temporary rise of platelets following a transfusion in purpura hemorrhagica is referable to a stimulation of the patient's platelet-forming elements or to a prevention of their destruction. Repeated transfusions are especially indicated in conditions where the toxine is recognized and its source has been removed, as in the aplastic anaemia of benzol poisoning. By so doing the bone marrow has a chance to regenerate. Transfusion, especially early, in melena neonatorum is in many instances curative. In purpura hemorrhagica it is often temporary only.

The next best treatment to transfusion is the use of thromboplastic preparations derived from fresh tissue juice. Tissue juice accelerates the coagulation of blood markedly, as do platelets. This action of tissue juice has been recognized for years, but it has been but occasionally used for therapeutic purposes. With Howell's discovery that certain extracts of brain having the properties of kephalin exert a marked thromboplastic action, it has been quite simple to obtain concentrated, stable and active preparations. A thromboplastic preparation has been used by Fonio under the name of coagulen.

DISCUSSION.

Dr. Vincent: A vital defect in the blood itself is probably the basis of the purpuric conditions observed in various diseases in infants and children. In some instances this defect is apparently congenital, as in hemophilia and hemorrhagic disease of the newborn; in others it is evidently acquired during the course of the disease, and is only a symptom of the disease, as in certain cases of obstructive jaundice in aplastic anaemia and in the various purpuras. Some of these conditions improve without treatment and others, aplastic anaemia for instance, are fatal in spite of any treatment, but in all of them, as regards the symptom of hemorrhage, transfusion has proved the most effective measure. Transfusion is effective in two ways. It corrects, temporarily at least, the abnormal tendency to bleed and makes good the loss of blood.

At times in these purpuric conditions it is very difficult to make the correct diagnosis and to say whether we are dealing with an incurable disease or whether it is self-limited and one from which the patient can recover if he does not succumb to the loss of blood. In this group, in the absence of a positive diagnosis, it is advisable to try the effect of one transfusion and perhaps a second. To go beyond this is probably useless. In my experience with these purpuric conditions the need of repeated transfusions means a grave prognosis. Each transfusion becomes less and less effective. They may delay the fatal result but do not essentially alter the course of the disease.

Bleeding in obstructive jaundice in infants is sometimes seen in cases of congenital malformation of the bile ducts. Here the blood defect is a lack of available calcium as shown by the "calcium in vitro" test. These cases should be given calcium lactate by mouth. One sometimes sees a case of permanent biliary fistula after operation that finally develops a pathological tendency to hemorrhage, which seems to be associated with the absence of bile from the intestinal tract. These cases should be given ox-gall until the faeces are a normal color. In either instance if the bleeding is acute and the condition serious, transfusion is indicated.

In small children and infants the main difficulty encountered in transfusion is associated with the small size of the veins. If those at the elbow and ankle are too small, the external jugular may be used. In infants with an open fontanelle the blood is very easily injected into the longitudinal sinus.

ILIAC ADENITIS AND ABSCESS.

Dr. Charles G. Mixter, Boston: Iliac abscess is a condition that one does not find mentioned in the text-books of pediatrics, and in the text-books of surgery it is only broadly considered under the discussion of retroperitoneal abscesses. In this connection the abscess starts along the spine in the lumbar region or about the kidney, and by gravitation the pus works downward and points not infrequently above Poupart's ligament. The lesion is primarily a lumbar abscess. Again, one sees an abscess in the iliac fossa, secondary to a bone lesion of the pelvis not infrequently. Here osteomyelitis of the ilium or one of the other bones of the pelvis is the primary cause. Such secondary abscesses belong to the consideration of the primary disease and will not be included here.

Iliac adenitis and abscess in children, however, is such a definite surgical entity, that its symptomatology should be understood and its importance emphasized. Similar to gland infection elsewhere, there is, first, an acute adenitis of the iliac glands, by invasion through some portal of entry. At this stage the infection may subside and the glands gradually diminish without giving rise to further trouble. If the inflammatory process continues, focal necrosis takes place within the glands, periglandular tissue is formed and a hard, indurated mass is palpable low down in the iliac fossa above Poupart's ligament. When this stage is reached the process rarely subsides; usually there is slow softening of the glands, with the formation of an abscess which pushes the parietal peritoneum inward and fills the iliac fossa. As the abscess enlarges it may descend occasionally into the pelvis when under great tension, bulging inward from the lateral wall, but never passing beyond the median line, where it is limited by the firm attachment of the peritoneum.

Iliac abscess is infrequently met with; in the last eight years only nine cases have been admitted to the surgical service at the Children's Hospital. We have seen it more frequently in boys than in girls, in the ratio of three to one, and chiefly in younger children. Only two of the children were over four years of age; seven were between one and a half and four years. In a considerable number of cases the iliac adenitis immediately followed a sore throat, cold or bronchitis, thus resembling many of the cases in the so-called milk infection epidemics, where the sore throat has been accompanied by marked abdominal symptoms. These cases would suggest that the adenoid tissue of the tonsillar ring may serve as a portal of entry. Chicken-pox and, particularly, measles are shown by the histories in many instances shortly to have antedated this condition. In one case a septic abrasion was noted on the foot on the corresponding side, and in another, the glands in the femoral region had previously been involved.

The record of the following patient will best illustrate the course of a typical case.

R. D. 2½ years old, girl baby. Referred to the Surgical out-patient department for an acute condition of the left hip. There was no family history of tuberculosis. One year ago the child had whooping cough. Otherwise always well. Ten days ago had a severe cold. Has not completely recovered from it. Four days ago child fell off a chair, since then a limp has been noticed. Refuses to walk today. Has complained of some pain in the abdomen and left hip. Feverish for the last 24 hours. No night cries. Bowels have moved daily. No vomiting.

Well developed and nourished. Physical examination negative except for abdomen and lower extremities. No glandular enlargement. Abdomen full but not distended, no spasm, some tenderness in the left lower quadrant and definite induration above Pourpart's ligament. Left thigh flexed at 90 degrees. Rotation at hip free—pain and resistance on extension. Some sphsm of hamstring muscles. Reflexes and measurements normal. White count 44,000. Temperature 102 degrees.

The child was referred to the house, and flaxseed poultices were applied to the abdomen. At the end of a week the abscess was opened extraperitoneally and drained. The wicks were removed on the eighth day. At the end of three weeks the sinus had healed, all spasm about the hip had disappeared and there was no limp.

The onset is generally subacute, symptoms in most cases having been noted for two or three weeks before the child was brought to the hospital. At first there is malaise and fever, followed in a few days by a noticeable limp and a persistent flexion of the thigh. This is the symptom on which the parents lay greatest stress. In the more severe cases the thigh will be held sharply flexed on the abdominal wall. Pain is referred usually to the hip, at times to the abdomen, but is usually not intense unless the limb is moved. Vomiting is rare and the bowels generally are regular, though occasionally there is abdominal distention and constipation. There are no night cries.

On examination the child is fretful, feverish, temperature 99 degrees to 102 degrees, and lies with one or both legs drawn up. The leg on the unaffected side can be readily extended, but any attempt to straighten the other leg will be met with a sharp outcry of pain and violent muscular resistance. The abdomen is soft, and involuntary muscular spasm is absent. Voluntary muscle spasm is found over the iliac fossa in which lie the inflamed glands, and when this spasm is overcome, induration can be detected above Poupart's ligament, or a definite mass may be felt in the more advanced stage.

The examination of the hip is of the utmost importance. Every effort should be made to have the child quiet, and the manipulations should be carried out with gentleness. With the leg in flexion, rotation is free, adduction and abduction are only slightly limited, if at all, and the thigh can be flexed until it causes pain by pressing on the abdomen. On the other hand, any attempt at extension is met with an outcry of pain, marked resistance and tilting of the pelvis from splinting of the psoas muscle. All measurements of the two legs are equal.

Rectal examination, which is of great value in many obscure lesions of the abdomen in children, will usually reveal a unilateral induration, or definite tense, tender abscess. The white count is elevated, varying from fifteen to forty thousand. The von Pirquet reaction is of importance only when negative, as so often happens in the diseases of childhood.

The failure to make a correct diagnosis of iliac abscess arises from the lack of recognition that has been accorded this condition. It is not included in the differential diagnosis when a case is met with. Not one of the nine cases was sent to the hospital with a correct diagnosis of the condition. Where the lesion occurs on the right side it is most often mistaken for an appendix abscess. In the latter condition the onset is more acute and there is involuntary spasm of the rectus muscle, and generally distention, or some intestinal disturbance. Resistance to extension of the leg is less marked. Where the abscess has extended into the pelvis, it gravitates to the pouch between the rectum and the bladder and commonly lies to the left as well as the right of the median line. In appendicitis with pelvic peritonitis in children, vesical irritation is frequent; generally pain on micturition and in consequence a distended bladder; sometimes frequency of urination. This symptom is absent in iliac abscess.

In psoas abscess the onset is more insidious, the child has night cries and a lesion of the spine can be demonstrated. A negative von Pirquet is important. The white count is lower and there is greater fluctuation between the morning and evening temperatures.

Where a lumbar abscess has pointed above Poupart's liagment there is tenderness and resistance in the loin and in the costo-vertebral angle.

In acute infections of the hip slight motion elicits pain and is limited in all directions. There is definite spasm of the adductor muscles and the resistance in the iliac fossa is absent. In epiphysitis and osteomyelitis there is thickening and localized tenderness.

In the treatment of iliac adenitis we find that rest in bed and frequent hot applications to the abdomen, to break the abscess down and bring it to the surface above Poupart's ligament, is preferable to early operation. The safety of the operation is far greater, as the chance of opening the peritoneal cavity is greatly diminished; and where the gland tissue is thoroughly broken down, the period of drainage is much shorter than when a large amount of necrotic lymphoid tissue has to slough out gradually. Even when a palpable tumor has formed above Poupart's ligament, the inflammatory mass may in rare instances subside without drainage, as occurred in one of our cases.

When a well-marked abscess has formed low in the iliac fossa, an incision is made above and parallel to Poupart's ligament, slightly below the anterior superior spine of the ilium. The peritoneum is pushed inward and upward without entering the abdominal cavity and the abscess is evacuated. Any necrotic gland tissue is gently wiped out and the cavity is drained with a rubber tube or cigarette wicks.

Cultures from the pus may show a growth of either streptococcus or staphylococcus. In one case the colon bacillus was found.

With proper drainage a favorable outcome may be expected in these cases. The spasm around the hip subsides and there is a rapid complete return of function. A discharging sinus will persist for a variable length of time, from three weeks to two months, depending upon the amount of the necrotic gland substance which has to separate.

In conclusion I would like to emphasize again the importance of bearing iliac adenitis in mind when an obscure condition in the lower abdomen or a puzzling lesion of the hip is encountered.

ADDRESS ON HEALTH INSURANCE.

Dr. A. N. Broughton, Jamaica Plain: Four years ago, the Workmen's Compensation Act was passed by our legislature and was an attempt to solve the unsatisfactory relations throughout the industrial world in the matter of industrial accidents. The Act was hailed as a great advance in social legislation, and great claims were made that under it, workmen would be far better treated in the matter of compensation and in the efficiency of their medical service, than ever before. As chairman of the committee of the Massachusetts Medical Society, I have given some attention to this Act for the last year, and know that the claims made for it in a very large measure have not been substantiated, and that a great deal of necessary effort has been put forth so to amend the statute as to make it really effective.

Now, to quote the words of Prof. Doten, who introduced the bill for social insurance last year in the legislature: "Having gotten the Workmen's Compensation Act satisfactorily into working order, the Association for Labor Legislation then turned its attention to health insurance," with the purpose of establishing that as the next important social legislation. There are two matters particularly involved in this proposal for health insurance. In the first place, as to the principle itself—is there any reason to believe that any considerable part of the benefits claimed for it would occur? This principle, put into operation, would enormously affect 75 per cent. of the practice of 75 per cent. of all the doctors throughout the state. It is in its very essence a medical problem, and it is entirely proper that the profession should first ask how much assurance there is that the benefits claimed by the proponents of health insurance would be actually realized. In this connection, our experience with the Workmen's Compensation Act has not been reassuring. It is fair to say that with every intention of helping in the future, as in the past, all measures which will advance preventive medicine, a very large part of the profession is critical of the efforts of the Association for Labor Legislation to force this matter along. And there is no question in my mind that it is the methods by which the attempt has been made to advance it, which have been the subject of criticism more than the principles involved, entirely proper as it is that these principles should be critically studied and thoroughly investigated. I do not believe that the profession at large is satisfied that the experiment as tried in Germany or in England has been sufficiently convincing to warrant its trial in this country, save under very different conditions and safeguards.

Next to the question of the principles involved, the second point centers again around the methods by which the proponents of this legislation have sought to advance it. This is very largely a medical problem, but in all the councils and in the Association itself, which has undertaken to establish this form of insurance, the medical profession is singularly unrepresented. The number of practising physicians who are active in the Association or who have been consulted, in this state particularly, has been almost negligible. That is the great objection in my mind and in the minds of a very great many of the profession throughout the state, to the whole matter. If the Massachusetts Medical Society and the Homeopathic Medical Society should be satisfied, in the first instance, that the principles of health insurance could be wisely and effectively applied to this state, it is then imperative that any movement looking to the establishment of the principle should be very largely in the hands of those who have got to carry on the work, taking such other advice from sociologists, employers, and others interested in the problem as might be necessary.

I believe, in closing, that the fundamental difficulty with health insurance as it has thus far been discussed in this vicinity is the old principle of taxation without representation.

DISCUSSION OF HEALTH INSURANCE.

Dr. James S. Stone, Boston: Health Insurance is a subject so complex and one of which I know so little, that I want much more to listen than to talk. But we must inform ourselves, and the issues brought up must be met fairly and in a very broad-minded way. The medical profession is vitally concerned with a right solution of the problems and we might as well realize at once that no legislature will consider the personal selfish interests of physicians if convinced that health insurance legislation will benefit the community at large.

Within a few days Dr. Cotton has brought forward the suggestion that the answer to the medical problem is the abolition of the problem. He suggests that the proposal to furnish medical care as part of the insurance benefits be eliminated and goes on to say:

"The move purports to be one for insurance of the workman; not for the regulation or ruination of medical practice in this Commonwealth. Let it be an insurance measure pure and simple.

The proposals to let John Doe, sick and off the job, have half, two-thirds, or three quarters of his wages, while he is out, sounds well; is probably wise, and is very likely entirely feasible. But that is no reason why Richard Doe, M.D., should be forcibly legislated out of his habits and routine, out of his dignity, as he conceives it, and very likely out of half his living as well; more particularly as he has not asked for any change or merited any regulation, so far as we know."

In considering this suggestion of Dr. Cotton's, it is important to realize exactly what he proposes. In reality he suggests unemployment insurance in place of health insurance.

Now to keep the issues clear, when we think of health insurance let us call it health insurance, and when we think of unemployment insurance let us call it that. But let us recognize too that insurance against unemployment due to illness must inevitably sooner or later involve the medical profession. When fire insurance was first undertaken the rates were equal for all. There immediately followed the differentiation into classes of risks, and there is a constantly increasing effort in the direction of preventive measures. Similar results must inevitably follow unemployment insurance. Medical inspectors must inevitably be appointed at first to prevent fraud and very soon to report on whether the sick workman is getting well as surely and quickly as is possible. Other obvious steps will follow. The medical problems cannot be divorced from the problems of unemployment insurance. I do not mean by this that it may not be better to have the laws governing health insurance enacted as a natural result of conditions arising year after year, rather than to attempt to enact a complete piece of legislation at the beginning. These are two different methods of meeting a most difficult and complex set of problems. But it is a great error to feel that we can avoid being involved by declining to take part in the settlement of problems which hinge upon preventive medicine.

Many progressive employers are beginning to realize the economic value of keeping their employees healthy. They are employing physicians and nurses to care for the slightest injuries at once, and to insure rest and care for those even slightly ill.

In the same way the school physicians and nurses are doing much to insure care of the children at the very onset of their illness.

Unemployment insurance alone will do much to provide good care and sufficient food for the children whose fathers are sick. It may be best to insist that if social legislation is to be enacted at all it should be simply unemployment insurance at first; and that the medical aspects be left for later consideration. But if so, let us do it with the full understanding that the medical problems will arise immediately and cannot be avoided.

Those of us who are interested in hospitals must realize the possible effects upon gifts and legacies which may follow taxation to care for the sick.

The problems are most complex. They cannot be avoided. We have started along the road of preventive medicine. The medical profession must point out the best ways in which the aims of preventive medicine can be fostered, or else be content with such legislation as is forced upon us by the legislature seeking the good of the commonwealth.

DR. EMMONS: Infant mortality during the first month of life, when prenatal causes are active, amounts to about 40% of the total. This mortality has been shown by the United States Children's Bureau investigations to be rising rather than falling. To one working in the poorer districts of the city, this fact is not surprising.

I ask you, gentlemen, if the medical profession is doing anything to improve this situation and whether some change is not desirable?

I favor the principles of health insurance because I believe that with organized care to carry out the object, maternity benefits would in time result, and that such organized care should improve the situation and give us some system for steady improvement in our results of maternity work.

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Book Reviews.

Diseases of the Genito-Urinary Organs and the Kidneys. By ROBERT H. GREENE, M.D., Professor of Genito-Urinary Surgery at Fordham University, New York; and HARLOW BROOKS, M.D., Professor of Clinical Medicine, University and Bellevue Hospital Medical College. Fourth edition, thoroughly revised. Octavo, 666 pages, 301 illustrations. Philadelphia and London: W. B. Saunders Company. 1917.

The publication of the fourth edition of this book has been demanded, not so much because of material changes in the subject-matter, as because of the popularity of the preceding editions. The present book is practically identical with the previous (third) edition, which was reviewed in this JOURNAL three years ago. It is a trustworthy, comprehensive text-book, which has stood the test of time, and has enjoyed the popularity which its previous editions have merited, and which the present edition will undoubtedly command.

Abnormalities of Myocardial Function. By T. STUART HART, M.D. New York: The Rebman Company. 1917.

Dr. Hart has written an excellent book of three hundred pages based almost exclusively on the newer graphic methods. Nevertheless, the book meets admirably the needs of the student and practitioner who want to know modern medicine in the light of new advances and yet have not the opportunity themselves to utilize these instruments of precision. It is a well-written book, lucid and direct, with a minimum of unnecessary material.

An Introduction to Neurology. By C. JUDSON HERRICK, Professor of Neurology in the University of Chicago. Philadelphia and London: W. B. Saunders Co. 1917.

This little volume is called an introduction to neurology, but the reviewer, in going through the volume, is continually amazed to find the amount of exact information contained in it, and only closer study shows that this has been attained by the most careful condensation in which it seems that no important fact has been omitted, and no unimportant ones allowed to take space required for the essentials. On almost every page we see the evidence of the work, not only of a careful student, but of an expert, not only in his field, but in teaching.

Especially to be commended is the avoidance of the error of going in too great detail into the course of tracts of fibres, perhaps well known anatomically, but the function of which still remains unknown to us, and the amount of space given to making clear to the student the fundamental physiologic principles of action of the complicated structures of the nervous system.

Taken as a whole, we know of no book better fitted to serve as an introduction to serious study of this fascinating but difficult branch of knowledge.

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126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

MEDICAL EXAMINATION OF RECRUITS.

IN the present issue of the JOURNAL are published four articles of especial interest in relation to the medical examination of recruits. The general physical examination of soldiers involves several special points of importance, differing from similar examination in civil practice, especially on account of the liability to malingering in a draft army.

On page 232 appears a report of an address by Major Brownlee, outlining the general methods and technic to be pursued in examining recruits. Following this is a report recently submitted to the Surgeon-General of the army by the committee on clinical methods and standardization of examinations and reports, which is a sub-committee of the Mental Hygiene War Work Committee of the National Committee for Mental Hygiene. The latter, as is well known, has been authorized by the Surgeon-General to organize and equip neuro-psychiatric hospital units, to be attached to the base and other military government hospitals. This report represents the first attempt ever made in organizing an army to take into consideration the neuro-psychiatric qualifications of the men. It has been accepted by the surgeon-general, and is to be used as the basis of an official circular from his department.

On page 236 of this issue of the JOURNAL is published further a letter dealing with the latest modifications of the plan of the medical department in dealing with the detection of tuberculosis among recruits for the National Army. This modification involves some departure in detail from the plan originally outlined editorially in the issue of the JOURNAL for July 5 (page 19) and amplified in succeeding numbers. Finally, on page 213 is published a paper by Dr. Richards, dealing with the special methods and tests applicable to the determination of deficiency in hearing, especially the detection of malingering, as applied to army physical examinations.

A perusal of these four papers should be of value to general practitioners about to undertake in any capacity the examination of recruits for military or naval service. It is hoped that other papers of a similar nature, dealing with special aspects of the problems involved, may appear in subsequent issues of the JOURNAL.

PAUCITY OF MEDICAL RESERVE OFFICERS.

THE Massachusetts State Committee for National Defense has received from the National Council the surprising statement that out of 5869 doctors in the state, only 279 have been recommended for the Medical Officers' Reserve Corps; that is to say that only 5%, apparently, of the Massachusetts physicians have offered their services to the country in the existing crisis! These figures are so surprisingly small that it seemed at first as if an error must have been made, but upon careful consideration of existing data we find that these figures are substantially correct. The State Committee for National Defense therefore makes, through the pages of the BOSTON MEDICAL AND SURGICAL JOURNAL, a most urgent appeal to the physicians of Massachusetts immediately to make application for an appointment in the Medical Officers' Reserve Corps, or for an appointment to the regular Medical Corps, either the army or the navy.

It is particularly important that young men who have recently finished hospital appointments should volunteer directly. As is well known, any healthy man of less than fifty-five years, particularly those men who are without dependents, will be welcomed, as they are very greatly needed under existing conditions. Applications cannot possibly be made too soon, since it requires three or four weeks to receive a commission after application has been made.

It is also probable that a considerable number of doctors have been examined for the Medical Reserve Corps and have received their commissions, but have not accepted them. It is more than ever essential that the men should accept their commissions immediately, as their services are not available to the country until they have formally accepted the rank given them.

John Bapst Blake, *Chairman,*
Massachusetts State Committee
For National Defense.

INDUSTRIAL HEALTH INSURANCE.

The attention of members of the Massachusetts Medical Society, and of other readers, is particularly directed to the report of notes taken by the Society's committee at a recent conference on social insurance, published on page 229 of this issue of the Journal. It is also directed to the remarks on health insurance by Drs. Broughton, Stone, and Emmons, reported on page 225 of this issue, in the proceedings of the New England Pediatric Society.

MEDICAL NOTES.

Insanity Statistics.—*Mental Hygiene* has published in a current issue statistics regarding the increase of insanity in the United States, which go far to correct the popular supposition that insanity is increasing in this country to an alarming extent. From 1910 to 1917 the population increased 11.80%, and during this period the rate of increase of the insane in institutions for insanity was 24%. The rate of increase of the insane in our institutions since 1904 has been more than three times as rapid as it was during the fourteen years preceding 1904, but there has been no acceleration of the rate during the past seven years. Various conditions have worked, however, to increase the number of insane treated in institutions.

Gift to University of California.—The University of California has received from Dr. T. Brailsford Robertson, professor of biochemistry and pharmacology, his patents for the growth-controlling substance, tethelin, isolated by him from the anterior lobe of the pituitary body. Should there be an income from the sale or lease of these patents, such income is to be used to establish a fund known as "The University of California Foundation for International Medical Research," to be expended in research in the physiology, chemistry and pathology of growth.

WAR NOTES.

Mental Hygiene War Work Committee.—The Mental Hygiene War Work Committee of the National Committee for Mental Hygiene is anxious to obtain the names of psychiatrists and neurologists who are willing to give part-time service in the examination of National Guard troops in their vicinity. The recent decision of the War Department to examine the National Guard troops in their armories before sending them to camp, makes it necessary to secure at once a large number of examining physicians. To meet the situation, the Surgeon-General of the Army has arranged to accept for this work qualified physicians on contract. A physician may contract for specified duty, at a specified place, for a specified time, or for part-time. This latter provision makes it possible for many physicians who cannot take out commissions, or who cannot give all of their time to the work for a period of months, to give part-time each week. Further information can be received from Dr. Frankwood E. Williams, vice-chairman of the committee, 50 Union Square, New York City.

War Relief Funds.—On Aug. 11 the totals of the principal New England war relief funds reached the following amounts:—

French Wounded Fund	$245,657.12
Armenian Fund	213,436.70
Surgical Dressings Fund	114,974.01
British Imperial Fund	105,046.00
Serbian Hospitals Fund	100,486.82
Boston Red Cross Fund	78,307.87
Polish Fund	76,906.18
French Phthisis Fund	68,333.33
Italian Fund	43,749.72

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—The total number of deaths reported for the week ending August 4, 1917, was 249, against 202 the corresponding week last year, making a death rate of 16.81, against 13.85 last year.

The number of cases of communicable diseases reported was: diphtheria, 41; scarlet fever, 12; typhoid fever, 3; measles, 43; tuberculosis, 63.

Included in the above were the following nonresident cases: diphtheria, 7; scarlet fever, 2; typhoid fever, 1; tuberculosis, 6.

The number of deaths was: diphtheria, 2; measles, 2; tuberculosis, 22.

Included in these were the following nonresidents: tuberculosis, 2.

The Blind in Massachusetts.—The Massachusetts Commission for the Blind, which has been in existence for ten years, has arranged and printed in pamphlet form a survey of its work for that period. This was done with the idea of making the best possible use of the experience of the Commission for this period of time, both for future work of the State and for any help it may yield to other communities. The six men (three of whom were blind) invited to make this survey, were asked, not only because they were educators of the young blind, but because of their experience with the adult blind, three having served on State commissions. Their reports are printed in the following order: O. H. Burritt, principal of the Pennsylvania Institution for the Instruction of the Blind at Overbrook, Pa., discusses the organization of the Commission; J. J. Dow, superintendent of the Minnesota State School for the Blind, Faribault, Minn., reviews matters of record and report; Edward M. Van Cleve, principal of the New York Institute for the Education of the Blind, discusses the blind in the community; E. P. Morford, superintendent Brooklyn Industrial Home for the Blind, writes on the industrial home for the blind; and R. B. Irwin, of the board of education, Cleveland, Ohio, writes on the relation of the Commission to other agencies. As a document full of suggestions and information in this most important branch of social work, this pamphlet is of much value.

The Massachusetts Medical Society.

NOTES TAKEN AT CONFERENCE OF THE SPECIAL COMMITTEE ON SOCIAL INSURANCE, AT THE STATE HOUSE, AUGUST 1, 1917.

(After 11.30.)

Dr. W. P. Bowers and Mr. M. W. Alexander of the General Electric Company were present.

Dr. W. P. Bowers stated that he did not believe that at present there were sufficient data anywhere to answer the questions as regarding the need of health insurance, its cost, or the proper method of administration, and that he did not personally believe that this was the time for legislation, but if legislation was demanded he would propose a measure of partial insurance, by which in several years the community would be in possession of the necessary data with which to draw up a complete bill or to reject the proposition entirely.

This proposition he presented the Committee, and it will later appear in the columns of the Boston Medical and Surgical Journal.

The following questions were asked Dr. Bowers:

1. This question has been worked over in the legislature for seven, eight, nine, or ten years; how soon do you think it will be in form so a bill might be safely put?

2. Senator Washburn: Isn't there some phase of this proposition small enough so that something might be drawn up in the way of a bill which might mark progress?

(Senator Washburn had just come in, and did not know that Dr. Bowers had already covered this.)

3. Chairman: Would it be asking too much if you would outline your plan in writing and submit it within a reasonable time? Within two months would probably be satisfactory.

The following were asked Mr. Alexander, whose statement to the Committee can be found in his pamphlet, "Some Vital Facts and Considerations in Respect to Compulsory Health Insurance," March, 1917.

4. Have your employees an insurance company?

Answer: Mutual benefit insurance. This does not cover all the employees; takes in some 8000 people at the Lynn works. Statistics based on that show that the sickness rate is lower than some of the investigations show, and almost coincide with the report of the Metropolitan Insurance Company.

The proponents of health insurance base their arguments on the statements that the death rate is excessive, that the sickness rate is very high, and that the wage poverty is so great that the average man cannot afford to secure medical care. These points have not been proved by the proponents.

5. You spoke of there being a mutual benefit organization; is this voluntary on the part of the employees?

Answer: Absolutely.

6. Do you, or do you not, find that the employees who really need it the most, take advantage of it, or don't pay any attention to it?

Answer: The employees who need it most constitute a majority of the members except as far as the foreigners are concerned. Ninety per cent. of the workers in the foundries are foreigners, of no education; suspicion is very great among them, and they don't know English enough to understand the objects of the mutual benefit scheme. Most of the Americans are in it all right.

The idea is to have the employees themselves carry the insurance; the employer has nothing to do with it, except administrative supervision. We want the employees to do their own business; are trying to build up an industrial democracy—of themselves, by themselves, and for themselves. It is purely an employees' mutual benefit association.

7. Then a good way would be to educate the illiterate foreigners?

Answer: They change so rapidly that it is difficult to educate them.

Mr. Alexander: In approaching this problem, I would say that I would like to see the appointment of a national commission of eminent and competent persons, who would make a study of this subject. It should not be bound by state boundaries; it ought to be studied from a national standpoint.

Secondly, a strenuous effort should be made to take our Public Health Service and enlarge its powers, if necessary, putting in better talent if necessary, and have it get after sickness and death, and become familiar with every case that occurs, with a view to taking steps to prevent sickness, as far as it can be prevented. That is one of my dreams. I would like to see every man and woman examined at least once a year, or twice a year, by a public authority, free of charge, or, if preferred, by a private medical authority approved for this purpose. Then the state or nation would know what the development is, and could counteract incipient sickness. Instead of spending 25 or 50 millions for compensating people when they are sick, I think a million will do 25 or 50 times more good if spent in studying the health condition of the people and in going after incipient cases before they go beyond proper control.

We must not deal with men as industrial workers, or as agricultural workers, but as men and women of the community. It is a wrong conception that we should legislate for any part of the community in a question like that. It is the whole people that are entitled to the protection of the commonwealth.

8. Senator Washburn: Would you say that everybody should be examined at the expense of the state where his financial resources are below a certain plane, and at his own expense where they are above that plane? And that he should be examined twice a year?

Is that about as far as your mind has got in the way of any legislation?

Answer: Everybody should be entitled to free examination, unless he prefers to pay for it by employing a private authorized physician.

9. Senator Washburn: You spoke about the dangers of coddling: that a man might be in a position to go to work but it would give him a good chance to stay at home and be remunerated. What is going to be the effect on the people psychologically in bringing them into closer touch with the medical profession? I mean it seriously. My proposition is: Is it a fair statement, that many a man would be in better health today if he hadn't seen a medical man than if he had seen one? Cutting out the undesirable doctor,—I didn't know there were any,—isn't there many and many a man who would be in better health today if he hadn't seen even the best physician?

10. Senator Washburn: You think that is infinitesimal (referring to Question 9). Do you think from your study of these medical propositions, that life is longer today than it was 50 years ago? Do you think the length of life is keeping step with the advance of medical science?

11. Senator Washburn: Your mind is very clear that you would like to see a preventive measure drawn up, and only wish the investigation continued? You mean, drawn up with the idea of perfecting a preventive bill? What sort of legislation would you like to see started?

12. Senator Washburn: Do you think the wage-earner is living better today than he was 20 years ago?

Answer: I think he is living better but less sensibly.

13. What do you think about the proposition given by Dr. Bowers this morning?

Answer: I think it a very ingenious and clever (in the right meaning of the word "clever") idea, and I am going to think it over. But I think that will have to be a second step and not a first step.

14. Mr. Morss: What do your people pay in that mutual benefit association, and what do they get?

Answer: Every man pays ten cents a week, maximum. They can never be assessed. And he pays ten cents a week only when it is needed,—when the treasury is pulled down. The average is $4 a year, or eight cents a week.

He gets for it $6 a week sickness benefit from the second week of sickness, and for a period of 14 weeks in a year; $100 death benefit; extra benefit to any amount or in any form voted by the association, for instance, a ton of coal, $20 a week extra, the services of an eminent surgeon, or $2 a week for an indefinite period; and he has a right to apply for a small loan, limited to $50 (in one instance, $100), if he can show to a committee of three that he is in need of the money to keep out of the hands of loan sharks. In the repayment, he pays neither fees, extras, or interest money; and the benefit association has never lost a cent.

15. Mr. Morss: Those benefits being administered by the men themselves, how much real difficulty do they have from malingering?

Answer: Less difficulty than if insured by the employer. It is a federation of small sections, none having more than 150 members, all located in one department or one building, and each member knows all the other members; each section collects its own dues and pays its own bills.

16. Do they choose their own physician?

Answer: Yes. We don't pay the physician; merely have occasionally a high-class physician to check the claim.

(The new hospital is for first aid and accident cases only.)

17. You examine your men before taking them on? You don't examine them after they are taken on?

18. Senator Washburn: Do you think that we have data enough today by which we could draw up a wise preventive bill?

19. Do you feel that at the present time there is any need of this health insurance? Any public demand for it?

Answer: I think there is no great need and no great demand for it. There is an apparently loud demand, and it is voiced by people whose heart rather than head speaks in the proposition. They don't know the situation.

20. Representative Brogna: Do I understand that you are convinced that some form of social insurance is bound to come in this country?. . . Do you base that upon the opinion that as we go along, we shall be worse off, or because there is a need and we have no statistics of the need?

Answer: Because I think there is a certain amount of sickness which cannot be checked in people unable to secure care for themselves, and somebody must take care of them.

21. Representative Brogna: Then your position is that, because of the mode of living at the present time, or the senseless mode of living, we are going to be in a worse position 10 or 15 years from now than at the present time?

Answer: I believe we shall have a larger percentage of sickness in 15 years from now than we have now, if we don't now deal with the question of preventive medicine.

22. Your opinion is that if a sufficiently broad proposition of preventive medicine is adopted throughout the country, that will forestall any social insurance scheme such as is now under consideration?

23. At the present time, you think there is no great need of health insurance?

Answer: I think there is no need for the enactment of a law that will involve much money and cause bad social tendencies, just because there are some men who cannot take care of themselves.

24. Senator Washburn: I would like to ask whether the weight of the enthusiasm of some manufacturers that this should be solved by a preventive bill rather than social insurance, is poisoned by any desire to save their own pocketbooks?

. . . Supposing you were on this committee and heard the charms of a preventive bill from the mouth of a representative of a large industrial plant, would you drink it in?. . . Not because he is a lawyer, but because he is enjoying a retainer from a large company?

Answer: I might be suspicious, but I believe that a good many manufacturers, without knowledge of the facts of the situation, would be more apt to shout for a compulsory, contributory health proposition than for a preventive medical proposition, because the very word *compulsory* attracts them.

25. Senator McLaughlin: What do you think of the possibilities of passing through the legislature a law requiring a physical examination of the people? Last year we had the "incorrigible consumptive" bill, under which the board would be allowed to walk into a man's home and have him put into a "detention camp" or some such place. What do you think of passing through the legislature a bill that a man must submit himself to an examination twice a year?

26. Senator Collins: Do you suppose that if every employer of labor compelled a physical examination of his employees, it would remove such a large percentage of danger that it would get the bill through?. . . It is probably a matter of the education of the people.

27. Representative Brogna: (In answer to Mr. Alexander's statement that only 50 out of 17,950 who had applied for work had refused to submit to physical examination): Those men were looking for a job, and they have to stand a lot of indignity from employers when they are looking for employment; but supposing I, working for myself, were asked to be examined twice a year, wouldn't I say it's nobody's business but my own, and change my mind about this democratic government that compelled me to do this?

Mr. Alexander replied that now the company were more anxious to get employees than the men were to get work.

28. Senator McLaughlin: Would you be in favor of passing that compulsory physical test, providing a great minority of people rose up and opposed it? I have in mind a great many people who might think it an infringement on their beliefs. . . There is a great sect in this town, influential, intelligent people, who would oppose such a plan. They would believe it a direct trespass on their rights spiritually.

(Mr. Alexander thought they could probably be convinced; that they were not a majority or a large minority; a special class, but far from being a large minority.)

29. Senator Washburn: Wouldn't such a bill be unconstitutional if it interfered with their religion?

30. Isn't it a fact, that the fellow who doesn't want to be examined is the one who ought to be examined? The fellow who is all right has nothing to worry about.

31. Would they be examined by physicians paid by the state or by the employer?

32. Has your concern or any other had any friction with labor organizations because of the examination? Can you conceive of the possibility of putting one over on the labor unions?

NOTES FROM THE DISTRICT SOCIETIES.

Worcester District Medical Society.—This Society, in special meeting assembled, Aug. 1, 1917, declared its opinion:

First, That its members attending patients of Fellows absent in military service of the United States, or its Allies, are in honor bound to turn over to the authorized representatives of such absentees, one-third (at least) of fees collected from such patients, provided always that the absentee is willing to accept this service.

Second, That the Society also declares its opinion that its Fellows, thus practicing, *in loco absentis*, should decline to attend former patients of the absentee for a period of six months after his return, unless by his express consent.

Third, The Society authorizes its Secretary to furnish, to each Fellow, a placard for posting in his office, embodying this declaration of policy, as approved by the Society, and an invitation to patients of such absentees to assist in the application of this policy, by declaring themselves as such patients.

Fourth, That the Society elect a War Committee, consisting of five members, of which the President shall be chairman, *ex officio*, and the rest appointed by him for one year's service, at least; and the Society requests every practitioner entering military service to notify this committee of his action, and to specify whether or not he wishes to avail himself of the provisions of the above policy. This committee shall keep a list of such absentees and shall publish with the notices of regular meetings of the Society, such additions as come to their knowledge. The committee shall, as the agent of the Society, protect, in all practicable ways, the interests of absentees on military service, and may therefore devise and promulgate to the Society membership such rules and regulations as are, in its opinion, necessary to guide members in practical application of these policies. The committee shall act as referee in all cases that may be referred to them when the home-physician or the representative of the absentee is in doubt as to proper procedure.

Fifth, That the Society invites all registered physicians in this District, whether affiliated with this Society or not, to full and cordial coöperation in carrying out the letter and spirit of these policies; and the Society instructs its War Committee to use such means as it finds practicable to secure this desired coöperation.

Sixth, That the Society, through its War Committee, coöperate with the War Relief Committee of the Worcester Red Cross Chapter in the medical care of dependents of men enlisted from this district.

The War Committee is: Dr. Michael F. Fallon, *Chairman;* Samuel B. Woodward, W. J. Delahanty, George O. Ward, *Secretary;* Ernest L. Hunt.

Miscellany.

GENERAL MEDICAL EXAMINATION OF RECRUITS.

The following is a report of an address by Major Charles Y. Brownlee, of the United States Army Medical Corps, before a recent meeting of members of the medical examination boards of Brooklyn and Queens Counties, New York.

"In general, you must remember that a soldier is forced to undergo trials and hardships which men in civil life are seldom called upon to face. Therefore, a generally robust physique is essential if we are not to have an army of weaklings, increasing the sick report, filling the hospitals, entailing extra burdens on an already overworked medical department, and, by depleting an army at a critical period, inviting disaster.

"We in the Regular Army and in the National Guard have had to deal with men who voluntarily applied for enlistment, so we have had to be on the alert to detect concealed disabilities, and have had almost no malingering to deal with at this stage.

"You, gentlemen, will, no doubt, find many 'slackers,' who for various reasons will malinger or grossly exaggerate the effects of some trifling disease or injury.

"Now, as to appliances, etc., needed. First, if possible, have a well-lighted room, at least over 20 feet in length, convenient to a shower bath, if possible, in order to subject those requiring it, to a thorough cleansing bath.

"Scales—A scales such as are supplied by instrument houses, with measuring rod, is not essential. In fact, I have found that the rod often becomes loose and quite inaccurate. Ordinary grocer's platform scales, if in good condition, are quite satisfactory and quite accurate. Height measurements may be taken by marking off on a wall from a steel tape heights from 60 to 78 inches in ¼ inches, the inch marks to be longer than the quarters and marked with the height. By using a ruler or any flat, straight object, the height is obtained more accurately and quickly than by the ordinary rod and headpiece.

"Other essentials are a vision test card, tape measure, watch, stethoscope, head mirror, tongue depressors and aural specula. Also a spirit lamp, a few test tubes, acetic or nitric acid and Fehling's solution for those cases requiring a urinary analysis.

"A syhygmomanometer and microscope are occasionally needed, as is an ophthalmoscope. You have been furnished the regulations governing physical examinations, but perhaps a few additional remarks would not be amiss.

"You will more than double the number you can examine in a day by having an intelligent clerk to record your findings as you call them out. Record every physical defect found, whether it disables or not.

"Your table of height and weight gives a minimum of 60 inches and a weight of 118 pounds with eight pounds' variation, thus making a minimum weight of 110 pounds. Needless to say, at this height and weight, the man should be nearly perfect otherwise, and active, vigorous, well-proportioned and muscled.

"Reject the long, willowy, pale, narrow-chested youth, far below weight for his height, and the man of general poor physique, say, such a one of 70 inches and 125 pounds. As to methods of detecting malingerers, particularly in regard to vision and hearing, for obvious reasons, these should not be published, but remember your ophthalmoscope.

"Hernia disqualifies, but it must be an actual hernia, not simply a relaxed inguinal ring, as a very large proportion of relaxed rings never cause hernia.

"Of course, general diseases, such as chronic malarial poisoning with grave anemia or enlarged spleen, tuberculosis in any form, recurrent and chronic rheumatism, malignant tumors, syphilis, also cystitis, etc., are all causes for rejection. As to flat feet, your instructions are so concise that nothing more need be said.

"Mental and Nervous Diseases—Look out for those of defective mental development. They are only a nuisance in the Army. Of course, all forms of insanity are cause for rejection, as is epilepsy and severe chorea. In regard to the man who states he is subject to fits, have him procure a statement to that effect in writing from his family physician, that he has treated him for that disease prior to the passage of the Conscription law. Use the same procedure in regard to other diseases not readily discovered in a brief examination, such as bed wetting, recurrent abdominal pains, gallstones, nephritic colic, etc.

"As to the lungs, of course, you will be on the lookout for tuberculosis. In the great majority of cases there are such suspicious signs as will cause you to be particularly careful. In this disease, it is not only the subsequent disablement of the man himself that is to be considered, but the menace he will be to the health of his comrades.

"The Heart—Functional murmurs at the apex are extremely common in youth and young manhood. At times it is difficult to determine whether a murmur is functional or organic, but a murmur without secondary symptoms such as hypertrophy, irregularity or dyspnea may safely be classed as functional.

"Pronounced and persistent tachycardia from any cause rejects. Varicose veins, if quite large and prominent and over a large area, especially if associated with edema or ulcers, disqualify.

"Curvature of the spine, not interfering with functions and not easily detected with the clothing on, is not cause for rejection.

"The Extremities—Look particularly for ankylosis of elbow and chronic synovitis of the knee, the latter furnishing a large number of cases for discharge on certificate of disability in the Army. Total loss of either thumb or more than one joint of the right index finger, loss of either great toe, hallux valgus, if marked, severe bunions, marked hammer toes,—are all causes for rejection.

"I have mentioned a few of the more common disabilities which you will meet. Your medical knowledge will determine your course of action in the multitude of other conditions met. With an efficient clerk, after the first day, one physician can easily examine 100 men a day."

REPORT OF COMMITTEE ON CLINICAL METHODS AND STANDARDIZATION OF EXAMINATIONS.

To the Psychiatrists and Neurologists Assigned to Special Duty in the Military Camps of the United States Government.

In detailing psychiatrists and neurologists to special duty with the armies, the Surgeon-General has had in mind: (1) The proper care and treatment of soldiers who become incapacitated through mental or nervous disease. (2) The special examination of recruits in the training camps in order that those who, because of neuropathic or psychopathic conditions, are unfit for military duty, may be identified and discharged from service.

Until the troops move abroad, the chief and most important responsibility of the military psychiatrists and neurologists will be the special examination of recruits. It is obvious that no man should be eliminated from the service who is fit to render a valuable service in this emergency. On the other hand, it is quite apparent that individuals suffering from certain forms of nervous and mental diseases should not be permitted to enter into service, as experience with the American armies has shown quite conclusively that such individuals are not capable of military service even in time of peace, and experience in the European armies has shown beyond question that such individuals are not able to withstand the rigors of modern warfare. At critical times such individuals go to pieces, with the result that the military force is weakened, is hampered in the free performance of its function, and the Government is likely to be burdened after the war with the care of a large number of invalids.

At the request of the Surgeon-General, the question of those who should be excluded from the military services on account of mental and nervous disease, has been carefully studied, and with the approval of the Surgeon-General we would suggest that the following general outline be followed in determining this matter. It is important that the potential as well as the actual conditions of the recruit be kept in mind. For this reason emphasis has been laid upon the early symptoms of disease. Likewise, attention has been called particularly to those diseases which are most likely to be met and which have not very obvious symptoms but which, nevertheless, can be diagnosticated relatively easily and with considerable certainty. It is not to be assumed that other neuropathic and psychopathic conditions, when found, are not cause for exclusion. Most of these, however, such as multiple neuritis, various forms of paralysis, hemiplegia, cranial nerve palsies, and peripheral neuritis, have such striking symptoms that they are likely to be recognized before they come to the attention of the neurologists and psychiatrists.

Recruits to be Excluded.

I. NERVOUS DISEASES.

(*a*) *On the Basis of Disease.*

1. Tabes. (Look for Argyll-Robertson pupils, absent knee and ankle jerks, ataxia of station and gait.)
2. Multiple sclerosis. (Look for absent abdominal reflexes, nystagmus, intention tremors.)
3. Progressive muscular atrophy and syringomyelia. (Look for fibrillary tremors; atrophy in the small muscles of the hand and of the muscles of the shoulder girdle; scars on forearm and fingers caused by burning; deformities of feet.
4. Epilepsy. (Look for deep scars on tongue, face and head; voice. Where diagnosis depends only upon history of epileptic attacks given by the patient, the latter should be asked to give the address of the physician who has treated him. This history must then be verified by a letter from the physician.)
5. Hyperthyroidism. (Look for persistent tachycardia, exophthalmos, tremor, enlarged thyroid.)

(*b*) *On the Basis of Symptoms or Combination of Symptoms or History.*

1. Unequal pupils, irregular pupils, Argyll-Robertson pupils.
2. Nystagmus (in one not an albino), absent abdominal reflexes, intention tremor.
3. Absent knee jerks associated with some one other organic neurologic symptom.
4. Exaggerated tendon jerks, Babinski.
5. Disorders of station or gait.
6. Disorders of speech (on test phrases), facial tremor, one other organic neurologic symptom. (Stammering and stuttering *per se* are not significant of an organic neurologic condition. Stammerers and stutterers are rejected by regulations. See form No. 94777.)
7. History of epilepsy. (Ask the recruit to give the address of the physician who has attended him; this information to be verified by letter.)

II. MENTAL DISEASES.

(*a*) *On the Basis of Disease.*

1. General paralysis. (Look for Argyll-Robertson pupils, speech defect consisting of distortion of words, writing defect, consisting of distortion of words, facial tremor in showing the teeth, euphoria and marked discrepancies in giving facts of life.
2. Dementia precox. (Look for indifference, ideas of reference, feelings of the mind being tampered with (*e.g.*, ideas of hypnotism) auditory hallucinations, bodily hallucinations such as electrical sensations or sexual sensations, meaningless smiles; in general, inappropriate emotional reactions, lack of connectedness in conversation.)
3. Manic-depressive insanity. (Look for mild depressions with or without feeling of inadequacy or mild manic states with exhilaration, talkativeness and overactivity.)

(*b*) *On the Basis of Symptoms or Combination of Symptoms or History.*

1. History of previous mental illness. (Ask the recruit to state when and where he had such illness, in what hospital he was observed or treated, or by what physician he was attended; this information to be verified by letter.)

III. PSYCHONEUROSES AND PSYCHOPATHIC CHARACTERS.

(Look for phobias, morbid doubts and fears, anxiety attacks, fatiguability, hypochondriasis, compulsions, homosexuality, grotesque lying, vagabondage.)

IV. CHRONIC ALCOHOLISM.

(Look for suffused eyes, prominent superficial blood vessels of the nose and cheek, flabby, bloated, reddened face, purplish discoloration of the mucous membrane of the pharynx and of the soft palate; also ashen complexion and clammy skin; muscular tremor in the protruded tongue and extended fingers,—noticeable also in lack of control when the applicant attempts to sign his name; emotionalism, prevarication, suspicion; auditory or visual hallucinations, paranoid ideas.)

V. MENTAL DEFICIENCY.

(Look for defect in general information with reference to native environment, ability to learn, to reason, to calculate, to plan, to construct, to compare weights, sizes, etc.; defect in judgment, foresight, language, output of effort, suggestibility, stigmata of degeneration, muscular incoordination. Consult psychometric findings.)

VI. DRUG ADDICTION.

(Look for pallor, dryness of skin; flippancy, mild exhilaration—if under the influence; cowardly, cringing attitude, restlessness, anxiety—if without the drug; distortion of the alae nasi; contracted pupils—morphine—or dilated pupils—cocaine; dirty deposit at junction of gums and teeth; bluish and whitish needle scars on thighs and arms.)

(Signed)

August Hoch, M.D., Director, Psychiatric Institute, Ward's Island, N. Y. C.

Thomas W. Salmon, M.D., Medical Director, the National Committee for Mental Hygiene, New York.

Adolf Meyer, M. D., Director, Phipps Psychiatric Clinic, Johns Hopkins University, Baltimore, Md.

Pearce Bailey, M.D., Chief of Clinic, N. Y. Neurological Institute, New York.

E. E. Southard, M.D., Director, Psychopathic Hospital, Boston, Mass.

Joseph Collins, M.D., N. Y. Neurological Institute, New York.

Albert M. Barrett, M.D., Director, State Psychopathic Hospital, Ann Arbor, Mich.

T. H. Weisenburg, M.D., President, American Neurological Association, Philadelphia.

William A. White, M.D., Superintendent, Government Hospital for the Insane, Washington, D. C.

Robert M. Yerkes, Ph.D., Professor of Comparative Psychology, Harvard University, Cambridge, Mass.

Walter E. Fernald, M.D., Massachusetts School for the Feeble-minded, Waverley, Mass.

Major-General W. C. Gorgas,
Surgeon-General, U. S. Army,
Washington, D. C.

Sir:

In view of the fact that it will be necessary for the psychiatrists who are assigned to the various military camps to examine a large number of recruits in a brief space of time, it is felt by the undersigned that this work can be greatly expedited if the assistance of camp surgeons and line officers can be obtained in selecting from those who come under their observation, individuals likely to need neuro-psychiatric examination. This can be easily done if the medical officers, dental surgeons and line officers will keep certain fundamental things in mind. We would suggest, therefore, the following:

(1) That, in view of the importance of syphilis and hyperthyroidism in neuro-psychiatric conditions, all persons suffering from either of these diseases observed by the surgeons in the ordinary course of their work, be referred to the psychiatrist for further examination; and

(2) That the personality traits named below are of such importance as indicative of possible underlying mental conditions, that line officers be instructed to refer to the psychiatrist recruits under their observation who exhibit them. These traits are: Irritability, seclusive, sulky, depressed, shy, timid, over-boisterous, sleepless, persistent violators of discipline, "queer sticks," cranks, "goats"—butts of practical jokes, "boobs"—those who have difficulty in comprehending orders—dull, stupid, marked emotional reaction (such as vomiting and fainting) at bayonet drill, peculiarities of attitude, speech or behavior sufficiently marked to attract attention of associates, those resentful of discipline, suspicious, sleep-walkers, bed-wetters, those persistently slovenly in dress, those who have difficulty in executing muscular movements in setting up exercises.

Very truly yours,

(Signed)

August Hoch, M.D., Director, Psychiatric Institute, Ward's Island, N. Y. C.

Thomas W. Salmon, M.D., Medical Director, The National Committee for Mental Hygiene, New York.

Adolf Meyer, M.D., Director, Phipps Psychiatric Clinic, Johns Hopkins University, Baltimore.

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Walter E. Fernald, M.D., Massachusetts School for the Feeble-minded, Waverley, Mass.

Major-General W. C. Gorgas,
Surgeon-General, U. S. Army,
Washington, D. C.

Sir:

It is the belief of the undersigned that the neuro-psychiatric examination of a large number of recruits would be expedited if permission were granted to the psychiatrists in the various camps to train and utilize hospital sergeants or others who might be chosen by the psychiatrist, to make group examinations of recruits for the following conditions: Pupillary changes,—unequal, irregular, disorders of reaction,—absent or increased knee jerks, station and gait disorders, marked tremors (extended fingers), facial tremor on showing teeth.

Recruits found by the examining sergeant to exhibit any one of these symptoms should be referred to the psychiatrist for further and more intensive examination.

Very truly yours,

(Signed)

August Hoch, M.D., Director, Psychiatric Institute, Ward's Island, N. Y. C.

Thomas W. Salmon, M.D., Medical Director, The National Committee for Mental Hygiene, N. Y.

Adolf Meyer, M.D., Director, Phipps Psychiatric Clinic, Johns Hopkins University, Baltimore, Md.

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Correspondence.

EXAMINATION OF TROOPS FOR TUBERCULOSIS.

War Department, Office of the Surgeon-General,
Washington, July 30, 1917.

Mr. Editor:—

The Surgeon-General of the Army desires the fact to be known that since the publication of your excellent editorial entitled "Tuberculosis in the Army," in your issue of July 5th, 1917, there has been a change of policy, in that temporary commissions in the Medical Reserve Corps can no longer be promised to physicians who are willing to undertake the examination of troops for tuberculosis.

Additional officers are still urgently needed for the Medical Reserve Corps, and those qualified for the work can be used as tuberculosis examiners for at least four months from August 1st. But the accepting of a commission must be with the understanding that service is to be for the duration of the war, and candidates must be able to pass the required physical examination.

For temporary service, the physician is now engaged under contract for a definite kind of work, and, if desired, for a specified and limited period. Contract surgeons are not required to pass a physical examination, and there is no age limit. As their work will be of a purely professional nature and field service or exercise will not be required, any physician who is able to practice medicine under the conditions of civil life is physically acceptable.

It is unnecessary to point out the fact that this offer affords an opportunity, and probably the only opportunity, for the large number of physicians to render a valuable service, who ardently desire to do something for their country at this critical time, but who, by reason of age, physical infirmities, or professional engagements, are unable to accept a commission.

The invitation thus to act as Boards of Examiners in revision of the work of the regular examiners of recruits, is in itself a compliment to the civilian medical profession, and the selection of an internist for this work should be regarded as an honor.

The name under which he acquires the necessary military status and the compensation obtained, are surely secondary considerations for all who are actuated by patriotic motives. No greater service can be rendered the country by the medical profession than the elimination of the unfit from the Army, and tuberculosis is, as is well known, one of the most important causes of physical unfitness, while at the same time demanding special skill for its detection.

It is desired to examine thoroughly the soldiers of the National Guard and the National Army, when they are assembled at their cantonments in the autumn. A large number of expert examiners will be required for this work, so that all who are competent to undertake it, can undoubtedly be given employment.

Very sincerely,
G. E. Bushnell,
Colonel, Medical Corps.

RECENT DEATHS.

L. E. Russell, M.D., of Springfield, Ohio, died at his home in that city on August 2. He was sixty-six years old. Dr. Russell was a former president of the National Medical Association.

James Allen Nichols, M.D., a well known New York surgeon, died recently at his home in that city. Dr. Nichols was born at Crown Point, N. Y., in 1860, the son of Dr. Thomas Brainerd Nichols. He graduated from the University of Vermont and from the Long Island Medical College, receiving his degree in 1888. He was for a time professor of surgery in that institution, and later surgeon in the Women's Hospital in New York and professor of surgery in the Post-Graduate Hospital. He retired from practice eight years ago and devoted himself to medical jurisprudence. Dr. Nichols was a member of the County Medical Society, The New York Academy of Medicine, the Sons of the Revolution, the Society of the War of 1812 and of the Medical Jurisprudence Society. He is survived by his widow, one son and one daughter.

APPOINTMENTS.

Dr. Milton H. Foster of the Public Health Service has been appointed physician at the immigration station, Boston Harbor, to take the place of Dr. M. Victor Safford.

Dr. Donald Currie of the Public Health Service, for some time stationed at the Hawaiian Islands, has been placed in charge of the immigration station, Boston Harbor, to relieve Dr. S. B. Grubbs. Dr. Currie is well known for his work on the treatment of leprosy.

Dr. Horace D. Arnold, of Boston, has been appointed chairman of the Council on Medical Education of the American Medical Association, succeeding Dr. Arthur Dean Bevan of Chicago.